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A BRIEF DOCUMENTATION OF THE NORPAX OCEAN MODEL, (U)
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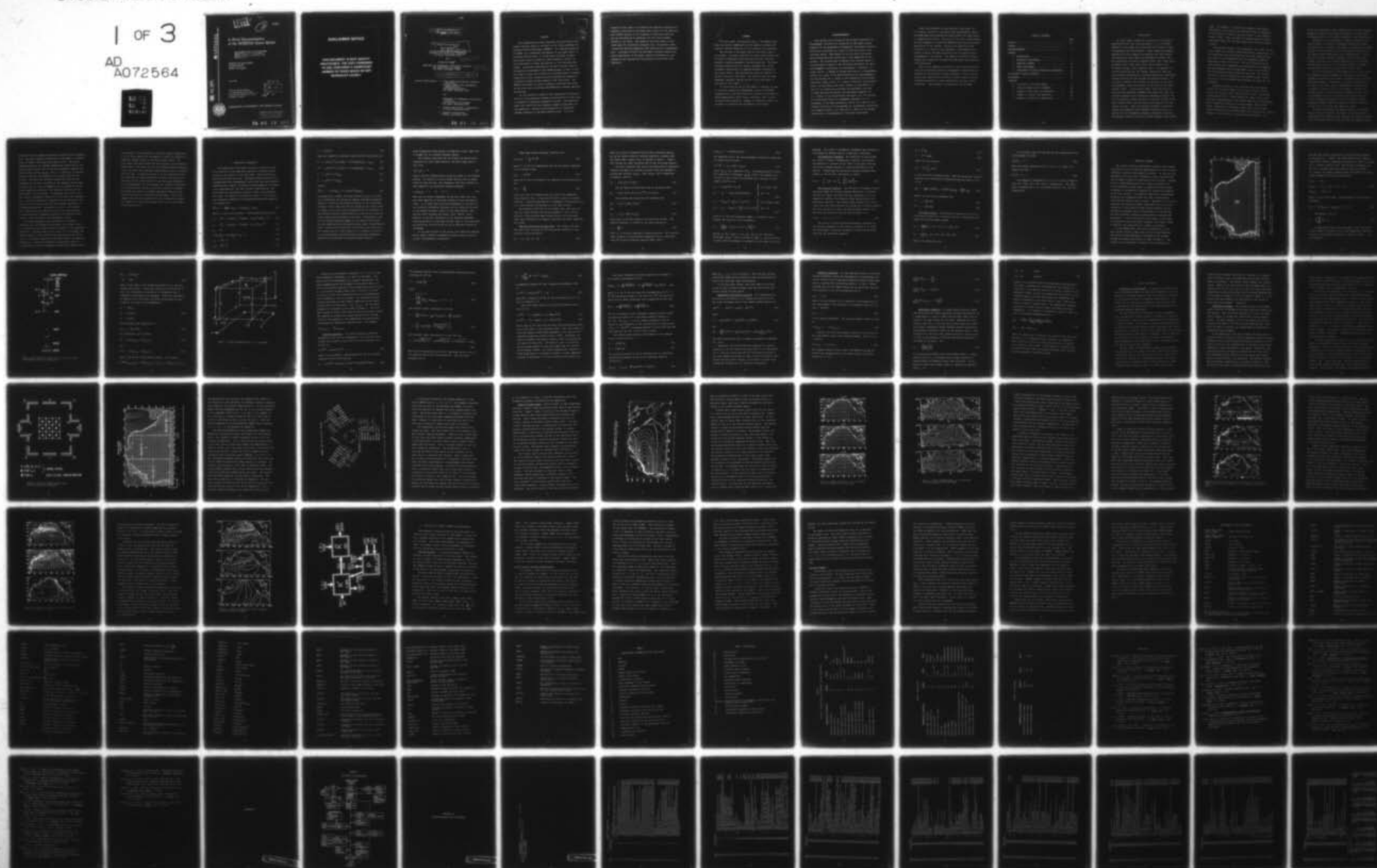

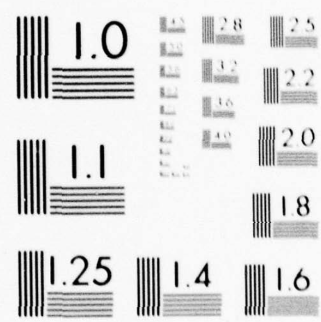


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# A Brief Documentation of the NORPAX Ocean Model

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# (6) A BRIEF DOCUMENTATION OF THE NORPAX OCEAN MODEL,

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# PREFACE

This documentation briefly describes the multi-layer, nonlinear, regional model of the North Pacific Ocean developed for the North Pacific Experiment (NORPAX). The long-term objective of NORPAX is to understand fluctuations in the upper layers of the North Pacific Ocean, in a time scale of months to years and a space scale in excess of 1,000 kilometers, as well as the relationship of these fluctuations to the overlying atmosphere. Large-scale modelling for the North Pacific Ocean is an essential sub-program of the NORPAX program in that it sets the stage for more local studies by indicating areas of maximum sensitivity and/or variability and by showing the dynamic relationship between diverse regions of the ocean basin. The NORPAX ocean model is based on primitive equations and serves as the first step in pursuing the NORPAX goal through numerical simulations.

In the simulation studies we have emphasized the physical nature of the large-scale abnormal characteristics of the ocean in response to anomalous atmospheric forcing. The simulation model also identifies the anomalous dynamics responsible for the generation, evolution, and dissipation of large-scale thermal anomalies in the North Pacific Ocean. It is the

purpose of this report to illustrate the physical processes and numerical structures of the model and to point out the efficient and flexible aspects of the software to facilitate those who may use the model as an essential tool for future dynamic studies in the ocean. The numerical solutions shown in this report are for illustrative purposes only. No specific effort is made for detailed comparison with observational oceanographic data. Although an effort has been made to ensure accurate and smooth description of the model, detailed information on the program is not required for the purposes of this brief documentation.

## SUMMARY

For this report, the physical bases of the NORPAX ocean model are briefly summarized and the numerical schemes and computer software necessary for its execution are presented.

Two versions of the model exist at the final stage of the project. One model simulates the ocean under steady, mean forcing of atmospheric conditions and the other simulates seasonal, varying atmospheric forcing conditions. The major difference between the two computer programs lies in the peripheral input/output of imposing boundary conditions at the ocean surface. Each program can easily be modified to fulfill the role of the other. For brevity, only the time-dependant, seasonal varying version of the ocean model is described in this report.

To facilitate the use of this model, a computer listing of the model program and subprograms is given in FORTRAN language with a brief description of constants and parameters. Input exemplifying initial start, continuous runs, and updating are also presented. Samples of simulated results are included to illustrate the performance of the model.

## ACKNOWLEDGEMENTS

This project was initiated at the Scripps Institution of Oceanography, University of California at San Diego and was completed at the Department of Atmospheric and Oceanic Sciences, University of Michigan as a result of the relocation of the principal author. Many people in La Jolla and in Ann Arbor were involved and have contributed to the completion of this project. The authors wish to express their sincere thanks to all with special thanks to the following individuals for their encouragement, discussions, and assistances: Professor J.D. Isaacs and Dr. J. Namias of Scripps Institution of Oceanography and Dr. W.L. Gates of the Rand Corporation for encouragements and discussions; Dr. K. Bryan of the Geophysical Fluid Dynamic Laboratory, NOAA, and Dr. R.L. Haney of the Naval Post-Graduate School for providing their early version of ocean model, and also Dr. R.L. Haney for providing the atmospheric data and for many spirited discussions and invaluable comments; Dr. J.J. O'Brien of the Florida State University, Dr. W.R. Holland of the National Center for Atmospheric Research, Dr. R.C. Allexander of the Rand Corporation, and Dr. W.B. White of the Scripps Institution of Oceanography for instrumental discussions and comments; Messrs. J.M. Park and R.A. Wylie of the Scripps Institution of Oceanography for their able assistances.

After the relocation of this project to Ann Arbor, Dr. E.J. Aubert, Director of the Great Lakes Environmental Laboratory/NOAA generously granted the senior author the time needed to complete this project. His and Dr. D.B. Rao's understanding and encouragement to finish the NORPAX-related work are greatly appreciated by the authors. We have also benefitted from Professor S.J. Jacobs of the Department of Atmospheric and Oceanic Sciences for many discussions and for administrative arrangements of the project. Our thanks to Frances Forrestel Zingale who helped edit the paper and Pam Downie who typed the final manuscript.

Most of the computer resources for this project were provided by the National Center for Atmospheric Research which is sponsored by the National Science Foundation. This research project was supported by the Office of Naval Research and the International Decade of Ocean Exploration, National Science Foundation. These supports are gratefully acknowledged.

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## 1. Introduction

In recent years, substantial deviations of sea-surface temperatures from their long-term means, i.e., the thermal anomalies in the ocean, have attracted the attention of many oceanographers and meterologists. These anomalous phenomena, together with their temporal correlations and their spatial teleconnections with oceanic and atmospheric changes, have been extensively studied by Bjerknes (1962, 1966, 1969, 1972), by Namias (1959, 1965, 1969, 1970), and by others (e.g., Petterssen, et al., 1962; Rodewald, 1963). The general conclusions ascertain that the thermal anomalies in the ocean are constantly modifying the overlying atmospheric circulation, thereby altering the wind systems and weather patterns. Observations indicate that climatic fluctuations in the ocean and atmosphere occur in all parts of the world at all times (Namias, 1965). In the Pacific Ocean, field data from the North Pacific Experiment (NORPAX) have shown that large temperature anomalies with intensities sometimes as high as 2°C to 5°C frequently occupy one-third to one-half or more of the North Pacific Ocean, and that they usually persist for long periods of time. Aside from possible feedback to the atmosphere, the anomalies cause abnormal advections which, together with the atmospheric anomalous variations, influence the general oceanic circulation patterns (Namias, 1965, Arthur,

1966). For example, in 1957-1958 an anomalous sea-surface temperature in the Pacific was associated with the weakening of the California Current which was forced to swing offshore (Isaacs, 1968). This resulted in a strong invasion of warm, subtropical water into the west coast as far north as British Columbia.

The physical natures of the atmosphere, the ocean, and the biota therein are closely coupled and mutually interacting. In the large-scale air/sea interactions the ocean primarily supplies heat to the atmosphere while the atmosphere supplies momentum and heat to the ocean. The heat released from the ocean modifies the atmospheric circulation while the momentum and heat exchange from the atmosphere to the ocean determine the flow pattern and heat content in the ocean. The oceanic circulation, then, redistributes the thermal energy, thereby setting up a closed feedback system between the ocean and the atmosphere.

Simulation studies of the ocean have been successfully carried out by Takano (1969), Il'in, et al. (1969), O'Brien (1971), Bye and Sag (1972), Bryan and Cox (1972), and Holland and Hirschman (1973). These authors have taken into account realistic configurations of the basins under their investigation with a simplified formulation of the systems. Bryan (1963, 1969b), Gormatyuk and Sarkisyan (1965), Bryan and Cox (1967, 1968), Crowley (1970), and Haney (1974) have included the complete dynamics in their models of certain idealized domains. Cox

(1970) has used Bryan's model (1969b), which includes the whole dynamics as well as the irregular boundaries, to investigate the monsoon effect on circulation patterns in the Indian Ocean.

Although it is not realistic to employ a regional atmospheric model for studies of planetary responses and global teleconnections, a regional ocean model is tolerable for dynamic studies in the ocean due to its solid boundary enclosure and the semi-isolated characteristics of certain basins. If one addresses the more specific problems of physical processes, thermal structures, and dynamic responses in an ocean under meteorological forcing, it is probably feasible to examine a semi-enclosed domain such as the North Pacific Ocean.

In the investigation of the anomalous state in the ocean, the anomalies can be considered as perturbation quantities, though not necessarily very small, superimposed upon the basic long-term averages. In general, the oceanic anomalies are, at least to the lower order of approximation, generated by atmospheric anomalies such as the anomalous pressure, the anomalous wind, the anomalous heat-exchange and water flux. An approximate method for estimating the large-scale sea-surface temperature anomalies due to atmospheric changes, proposed by Namias (1965) and extended by Arthur (1966) and Jacobs (1967), has shown some degree of success.

We have investigated the anomaly dynamics in the North Pacific Ocean by numerical simulation. The ocean model we developed for the anomaly study considers the actual configuration of the North Pacific Ocean and takes the complete dynamic

equations with all large-scale physical processes into consideration. The basic numerical scheme used in the model is a modification of Haney's idealized ocean model (1974). The space-staggered grid and the spacing differencing scheme used in the present model follows that of the UCLA atmospheric general circulation model (Gates, et al., 1971). In addition, the present model has improved the treatment of the upper boundary conditions. The heat flux variation between the ocean and the atmosphere is not only a function of the combined air-sea temperatures but it is also a summation of all heating and interacting components calculated from empirical formulae for the heat balance at the naviface. In computing wind stress, the near surface atmospheric stability is also taken into consideration. Both the longitudinal component and the meridional component of wind stress are used as the boundary conditions in the momentum equation. Furthermore, since it is well-known that salinity plays an important role in the ocean dynamics at high latitudes, a prognostic equation for salinity conservation is also included in the hydrodynamic system.

Our study originated from the objective of NORPAX to understand the low-frequency fluctuations in the upper layer of the North Pacific Ocean and their relations to the overlying atmosphere. The major goal of our study is to investigate the anomaly dynamics and to describe the configuration and evolution of the thermal anomalies in the North Pacific by numerical simulations. Because the anomalies are generally small, it is necessary to follow a systematic step-by-step approach from

the spin-up of an ocean model to the final anomaly experiments. A set of three papers are in progress to report the sequence of numerical dynamic study for the North Pacific Ocean. The first paper describes briefly the basic physics in the numerical model which is the basic tool for our thermal anomaly investigations, and shows the simulated long-term mean state in the North Pacific Ocean. Our major interest is in the large-scale (more than 1000 km) and long-term (months to years) fluctuations in the North Pacific Ocean relative to the overlying atmosphere. The following paper, II, will present the seasonal fluctuations in the North Pacific Ocean, and III will discuss the dynamic mechanisms and results of anomaly experiments based on real-time specifications in the North Pacific model. This report summaries briefly the discussions in the aforementioned papers with emphasis on the physical model itself and on its computational applications.

## 2. Theoretical Background

The formulation of the model is based on primitive equations relative to the right-hand spherical coordinate system $(\lambda, \phi, z)$ on the surface of the earth with z taken positive upward from the mean sea level. The Navier-Stokes equations for incompressible and nonhomogeneous fluid with some basic physical approximations, namely, the Boussinesq approximation, the hydrostatic approximation, the eddy viscosity approximation, and the traditional approximation (Eckart, 1960), are integrated with time. All symbols are defined in Table 1. Let (u,v) be the horizontal component of velocity $\mathbb{V}$ and define an advective flux operator as:

$$\mathcal{L}(q) = \frac{\sec\phi}{a}[(uq)_\lambda + (vq\cos\phi)_\phi] + (wq)_z \qquad (1)$$

where q is any scalar quantity. The governing equations are:

$$u_t = \mathcal{L}u + v\sin\phi(2\Omega + a^{-1}u\sec\phi) - (\rho_o a)^{-1}\sec\phi p_\lambda + F^\lambda \qquad (2)$$

$$v_t = \mathcal{L}v - u\sin\phi(2\Omega + a^{-1}u\sec\phi) - (\rho_o a)^{-1}p_\phi + F^\phi \qquad (3)$$

$$p_z = -\rho g \qquad (4)$$

$$a^{-1}\sec\phi[u_\lambda + (v\cos\phi)_\phi] + w_z = 0 \qquad (5)$$

$$T_t = \mathcal{L}T + Q \qquad (6)$$

$$S_t = \mathcal{L}S + H \qquad (7)$$

$$\rho = \rho(T,S,p) \tag{8}$$

where all alphabetic subscripts denote partial derivatives and

$$F^{\lambda} = \nu_1[\nabla^2 u + a^{-2}(1-\tan^2\phi)u - 2a^{-2}\tan\phi\sin\phi v_{\lambda}] + \nu_2 u_{zz} \tag{9}$$

$$F^{\phi} = \nu_1[\nabla^2 v + a^{-2}(1-\tan^2\phi)v + 2a^{-2}\tan\phi\sin\phi u_{\lambda}] + \nu_2 v_{zz} \tag{10}$$

$$Q = k_1\nabla^2 T + h^{-1}k_2 T_{zz} \tag{11}$$

$$H = k_1\nabla^2 S + h^{-1}k_2 S_{zz} \tag{12}$$

wherein

$$\nabla^2(q) = a^{-2}\sec^2\phi q_{\lambda\lambda} + a^{-1}\sec\phi(a^{-k}\cos\phi q_{\phi})_{\phi} \tag{13}$$

Following Bryan (1969b), the step function $h(-\rho'_z)$ in (11) and (12) incorporates the convective density adjustment mechanism wherein $\rho'$ indicates the potential density of the ocean water. Although in most cases the vertical column of the oceanic water is stable, notice that static instability due to inversions in the potential density stratification can occur at any level and cause strong vertical mixing in the ocean. Nevertheless, most of the unstable phenomena happen in the surface layers where all the atmosphere-ocean interactions and energy transformations occur. Since static instability in the real ocean lasts only for a short period of time (hours), it is simplest to treat it as an instantaneous convective density adjustment mechanism. Whenever the instability is detected between layers, a

quasi-homogeneous mixed density of marginally stable lapse rate is assumed for all unstable adjacent layers.

The boundary conditions for the lateral and bottom solid boundaries are zero normal velocity, and zero normal heat or salt flux;

$$\mathbb{V}_n, T_n, S_n = 0 \tag{14}$$

where n denotes differentiation along the normal of the boundary surface. In addition to the no normal velocity and no normal fluxes of heat and salt, the tangential free-slip condition is also imposed on the equatorial southern boundary,

$$v, u_\phi, T_\phi, S_\phi = 0 \quad \text{at} \quad \phi = 0 . \tag{15}$$

Note that the bottom topography and the geothermal heat flux have been neglected at the lower boundary in this preliminary study. It is known that the bottom topography is important to the vertically integrated transport and can influence the path of the western boundary current in the ocean (Warren, 1963; Holland, 1967; Schulman and Niiler, 1970; O'Brien, 1971). However, we are more interested in the anomalous phenomena existing generally in the upper shallow layer of the ocean where the baroclinic velocity field may not be markedly affected by topography.

At the upper surface of the ocean, the "rigid-lid" approximation (Bryan, 1969b) is employed in order to gain a more efficient time-dependent calculation.

Other upper surface boundary conditions are:

$$\nu_2(u_z, v_z) = \frac{1}{\rho_o}(\tau^\lambda, \tau^\phi) \tag{16}$$

where $\tau^\lambda$, $\tau^\phi$ are the longitudinal and the latitudinal components of the surface stress:

$$\kappa_2 S_z = S_1(E-R) \tag{17}$$

where E-R is the net difference of evaporation and precipitation; and

$$\kappa_2 T_z = \frac{Q_S}{\rho_o c} \tag{18}$$

where $Q_S$ is the net downward heat flux across the atmosphere/ocean interface and c is the specific heat of water at constant pressure. A detailed description of atmospheric forcing functions, i.e., wind stresses and heating is in the next section.

The boundary conditions of zero normal flow, zero heat and salinity fluxes through the lateral boundaries, zero vertical velocity at the balanced upper surface and at the bottom guarantee the satisfaction of integral constraints for mass, momentum, and energy.

<u>The wind stress and the heat flux</u>. The synoptic net downward heat flux, according to the heat balance equation at the naviface, can be written as

$$Q_S = Q_I - Q_B - Q_H - Q_E \tag{19}$$

where $Q_I$ is the net downward flux of solar insolation and $Q_B$, $Q_H$, $Q_E$ are upward fluxes of infrared radiation, sensible heat, and latent heat, respectively, as defined in Table 1. Table 1 also defines all other notations used in the following formulae.

The solar radiation flux can be calculated from a simplified formula with empirical constants obtained from the atmospheric climatology (Johnson, et al., 1958; London, 1957; Vonder-Haar and Hanson, 1969) as

$$Q_I = 0.95\ Q_o(0.74-0.6N_c)\ . \tag{20}$$

The net upward infrared heat flux is calculated from

$$Q_B = 0.985\ cT_s^{\ 4}(0.39-0.06\ e_a^{\ 1/2})\ (1-0.6\ N_c^{\ 2})\ . \tag{21}$$

The sensible and latent heat are computed from

$$Q_H = \rho_a\ C_H\ C_a\ |\mathbb{V}_a|\ (T_s-T_a) \tag{22}$$

and

$$Q_L = \rho_a\ C_E\ L\ |\mathbb{V}_a|\ (q_s-q_a) \tag{23}$$

where $|\mathbb{V}_a|$ is the wind speed at 10 m above the surface. The specific humidity is related to the vapor pressure by

$$q = \frac{.622}{P_a}\ e \tag{24}$$

where $P_a$ is the mean atmospheric surface pressure. The saturated vapor pressure at ocean-surface temperature can be calculated from the Clausius-Clapeyron equation (Hess, 1959).

$$\text{Log}_{10}\, e_s = (9.4051 - 2353/T_s)\ . \tag{25}$$

The momentum flux at the ocean-atmosphere interface is expressed as surface wind stresses,

$$(\tau^\lambda, \tau^\phi) = \rho_a\, C_p\, |\mathbb{V}_a|\, (u_a, v_a) \tag{26}$$

where $(u_a, v_a)$ are components of $\mathbb{V}_a$. Following Deardorff (1968) and using data of Bussinger, et al. (1971), the exchange coefficients of heat, water, and momentum are a function of atmospheric stability as,

$$\left.\begin{aligned} C_D &= (C_D)_N \exp(-2\,\beta_v\, Ri) \\ C_H &= C_E = (C_H)_N \exp[-(\beta_v + \beta_T) Ri] \end{aligned}\right\} \begin{aligned} &\text{for stable cases} \\ &(Ri > 0) \end{aligned} \tag{27a}$$

$$\left.\begin{aligned} C_D &= (C_D)_N \left[1 + \frac{7}{b_1} \ln (1 - b_1\, Ri)\right] \\ C_H &= C_E = (C_H)_N \left[1 + \frac{11}{b_2} \ln (1 - b_2\, Ri)\right] \end{aligned}\right\} \begin{aligned} &\text{for unstable cases} \\ &(Ri < 0) \end{aligned} \tag{27b}$$

where Ri is the bulk Richardson number, a parameter used to measure the stability of the atmosphere,

$$Ri = \frac{g Z_{10}}{T_{vo} \mathbb{V}_a{}^2} \left[(T_a - T_s) + 0.38\, T_a \frac{e_a - e_s}{P_a}\right] , \tag{28}$$

wherein $\beta_v$, $\beta_T$, $(C_D)_N$, $b_1$, $b_2$, $Z_{10}$, and $T_{vo}$ are constants (Bussinger, et al., 1971) as listed in Table 2. The coefficient of water particle-exchange is assumed to be the same as the heat

exchange. All values of atmospheric parameters are provided by Fleet Numerical Weather Central at Monterey, California.

The hydrostatic equation. The equations of state define the density in terms of temperature, salinity, and pressure. The departure of pressure at any level in the ocean from the vertically averaged pressure is uniquely determined by the density. Integrating the hydrostatic equation downward with respect to the vertical coordinate, we obtain

$$p'(z) = \int_z^0 \rho g dz - \frac{1}{D} \int_{-D}^0 \left( \int_z^0 \rho g d\xi \right) dz \ . \tag{29}$$

The vorticity equation. The exclusion of kinematic surface variations makes the surface pressure impossible to calculate. Instead, we compute the shear velocity components $(u',v')$ as prognostic variables with pressure terms substituted by the hydrostatic equation. The vertical mean velocity $(\hat{u},\hat{v})$ is obtained from the stream function by solving the vorticity equation. The total velocity is, then, the vertical mean velocity corrected by the deviation from the vertical mean, i.e.,

$$(u,v) = (\hat{u} + u', \hat{v} + v') \ . \tag{30}$$

The effect of surface and bottom boundary conditions on the vertical component of the current (w) permit us to define the nondivergent vertically integrated stream function which satisfies the continuity equation,

$$\hat{u} = -a^{-1}\psi_\phi \tag{31}$$

$$\hat{v} = a^{-1} \sec\phi\psi_\lambda \tag{32}$$

where, for any scalar q,

$$(\hat{q}) = \frac{1}{D}\int_{-D}^{0} (q)dz \tag{33}$$

is the vertically integrated mean. Then the predictive vorticity equation can be obtained by eliminating pressure terms in (2), (3) as

$$\nabla^2\psi_t = \frac{\sec\phi}{a}\{(\hat{G}^\phi+\hat{F}^\phi)_\lambda - [(\hat{G}^\lambda+\hat{F}^\lambda)\cos\phi]_\phi\} - \frac{\sec\phi}{a^2} f_\phi\psi_\lambda \tag{34}$$

where f is the Coriolis parameter and

$$G^\lambda = u + \frac{uv}{a}\tan\phi \tag{35}$$

$$G^\phi = v - \frac{uv}{a}\tan\phi \tag{36}$$

<u>The shear current</u>. The predictive equations for the vertical shear current (u',v') from (2) and (3), subtracting their respective vertical means, become

$$u'_t = \frac{-\sec\phi}{\rho_o a} p'_\lambda + fv' + F^\lambda + G^\lambda - (\hat{F}^\lambda + \hat{G}^\lambda) \tag{37}$$

$$v'_t = \frac{-1}{\rho_o a} p'_\phi - fu' + F^\phi + G^\phi - (\hat{F}^\phi + \hat{G}^\phi) \tag{38}$$

where p' is defined in (29).

It is obvious from (37) and (38) and the definition of the vertical mean (33) that

$$(\hat{u}'_t, \hat{v}'_t) = 0 . \tag{39}$$

With the initial condition $(u',v') = 0$ at $t = 0$, then, it is always true that

$$(\hat{u}', \hat{v}') = 0 . \tag{40}$$

The prognostic variables are $u'$, $v'$, $\psi$, $T$, and $S$ predicted from (37), (38), (34), (6), and (7), respectively. The diagnostic variables are $w$, $\rho$, $p$ obtained from (5), (8), and (29), respectively.

## 3. Numerical Schemes

The system of partial differential equations and boundary conditions in the continuum are approximated by a set of finite-difference equations and boundary conditions. As the grid size approaches zero, the finite difference solution obtained with any convergent scheme will approach the true solution. However, since no infinitesimal grid size is used in practice, the finite difference scheme chosen to compute the solution must be capable of economically reaching the statistical asymptote of the true solution. In numerical simulations the governing equations are integrated beyond the limit of mathematical justification based on local accuracy. Therefore, it is vitally important that certain integral constraints such as the conservation of total kinetic energy during adiabatic and non-dissipative processes and the conservation of total entropy and total potential enthalpy during adiabatic processes are maintained. In the construction of the model, we have used the quadradic conserving method (Arakawa, 1966; Bryan, 1969b) to maintain the conservation of integral constraints.

In the NORPAX model, the actual configuration of the North Pacific Ocean is taken into account by approximating the coastline with meridians or latitude-circles passing through the nearest grid points as shown in Figure 1. The origin of the coordinates is placed on the intersection of

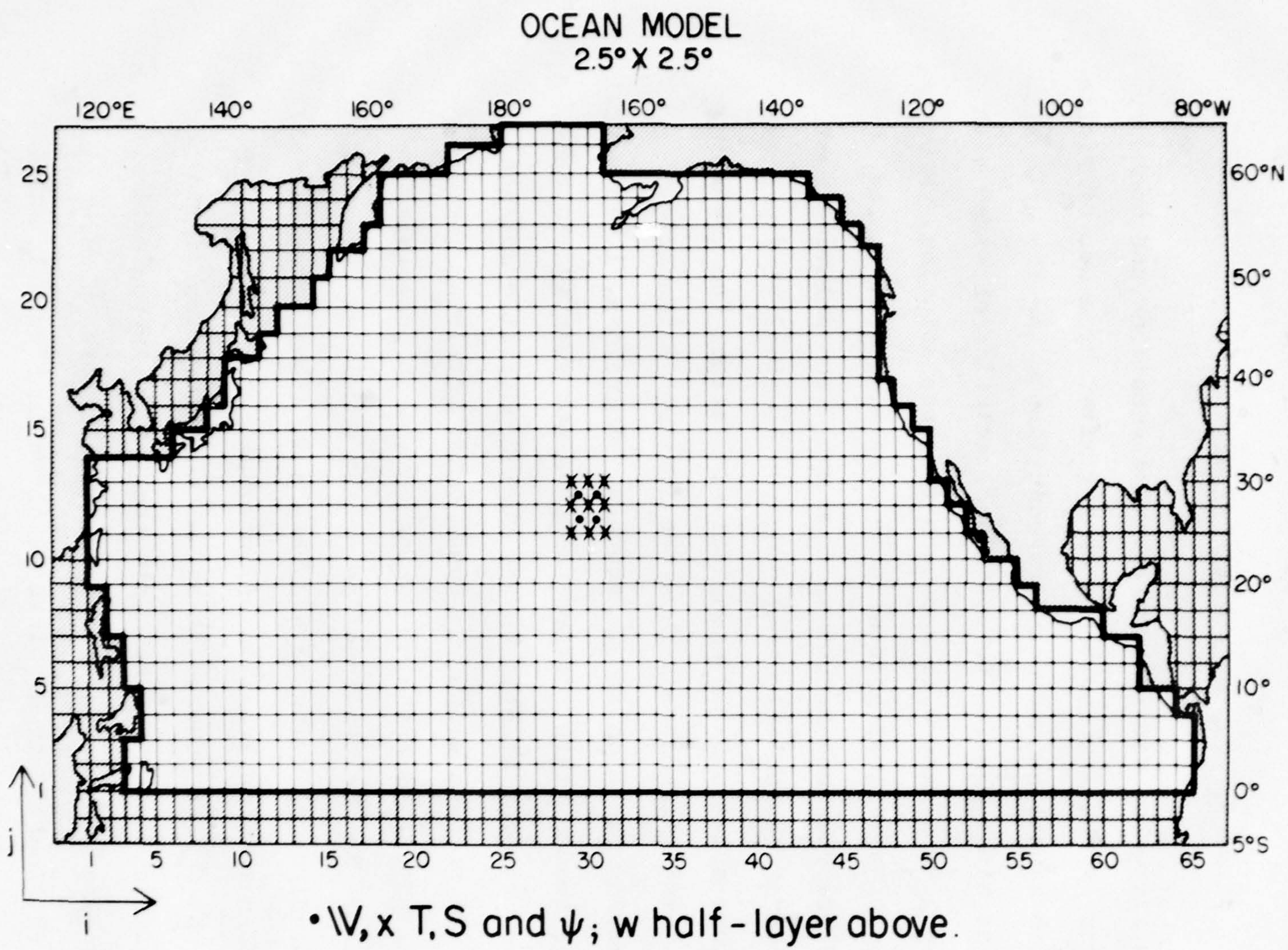


Figure 1. NORPAX model 2.5-degree x 2.5-degree grid mesh and parameters computing points of temperature, salinity, and velocity.

the mean sea surface, the equator, and the western boundary of the ocean ($\lambda_o = 120°E$). The whole North Pacific domain is from 120°E to 80°W in longitude and from 0°N to 65°N in latitude with a constant depth of 4 km. The vertical coordinate z is set for 10 variable-thickness layers as shown in Figure 2. If z denotes the height, negative below the surface, the thicknesses between the levels are defined as

$$\Delta z_{1/2} = -2z_1 ,$$

$$\Delta z_{k+1/2} = z_{k-1} - z_k, \quad k = 2,\ldots,K , \tag{41}$$

$$\Delta z_{K+1/2} = 2(z_K + D)$$

where D is the total depth. The *thickness of the kth level* is defined as

$$\Delta z_k = \frac{1}{2} (\Delta z_{k-1/2} + \Delta z_{k+1/2}), \; k = 1,\ldots,K . \tag{42}$$

The analog to (33) is

$$\hat{q} = \frac{1}{D} \sum_{k=1}^{K} (q) \quad z_k . \tag{43}$$

A computational box is one subvolume of the ocean with a finite angular difference of $\Delta\lambda$ in the longitudinal direction and $\Delta\phi$ in the meridional direction is shown in Figure 3. We have defined

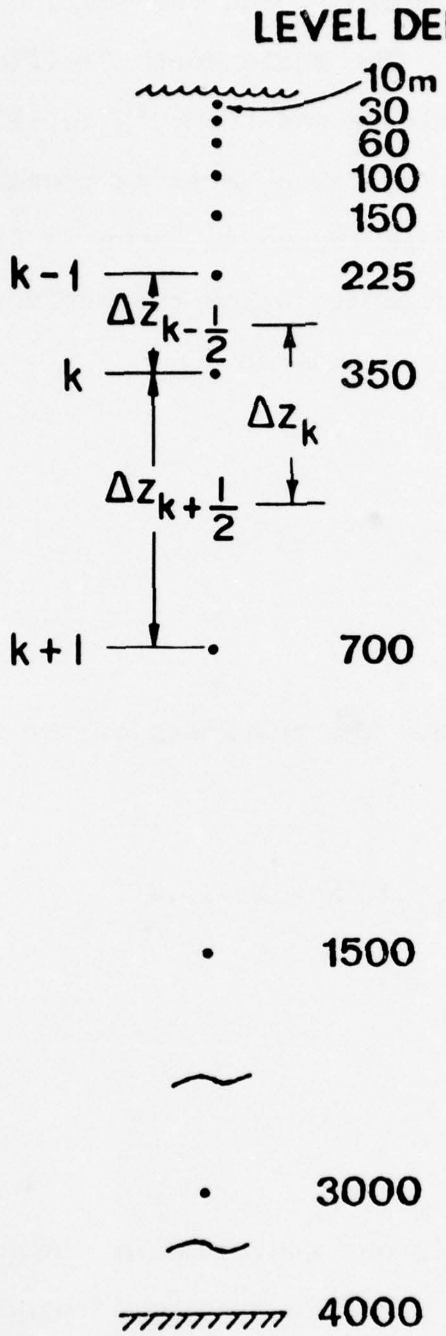


Figure 2. Level depths for vertical layers and layer thicknesses at the integer k and the half integer k+1/2.

$$\Delta x_{j'} = a\cos\phi_{j'}\Delta\lambda \quad ,$$

$$\Delta y = a\Delta\phi \tag{44}$$

where j' may refer to the integer grid points or to the half-integer grid points. Notice that, based on the definition of (44), the x-component is equivalent to $\lambda$-component and y-component is equivalent to $\phi$-component. Since the computation is carried out in flux form, the areas constituting one sub-volume in the ocean can be designated as

$$A_1 = \Delta y \Delta z_k \quad ,$$

$$A_2 = \Delta x_{j'} \Delta z_k \quad , \tag{45}$$

$$A_3 = \Delta x_{j'} \Delta y \quad .$$

The subvolume under computation is

$$\sigma_{j',k} = \Delta x_{j'} \Delta y \Delta z_k \quad . \tag{46}$$

For convenience, let us define

$$\overline{q}^{\ell} = \frac{1}{2} [(q)_{\ell+1/2} + (q)_{\ell-1/2}] \tag{47}$$

and

$$\delta^{\ell} q = [(q)_{\lambda+1/2} - (q)_{\ell-1/2}] \tag{48}$$

where $\ell$ may be any of the spatial indices. For instance,

$$\delta^{i}(\overline{\Psi}^{j})_{1+1/2,j+1/2} = \frac{1}{2} (\Psi_{i+1,j+1} + \Psi_{i+1,j}) - \frac{1}{2} (\Psi_{k,j+1} + \Psi_{i,j}) \ .$$

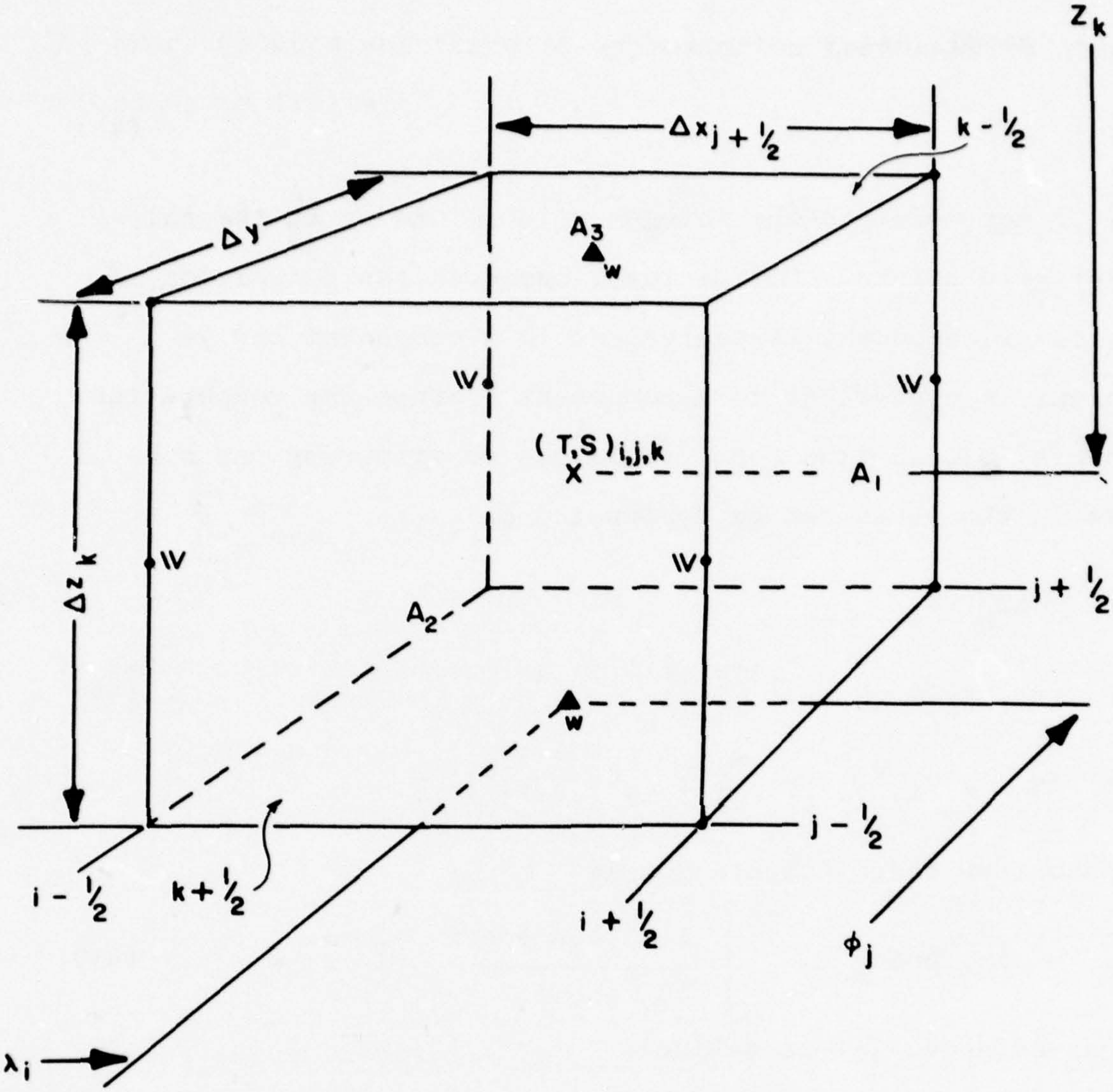


Figure 3. A typical computational box, i.e., a subvolume.

There are five prognostic variables, $u'$, $v'$, $\psi$, $T$, $S$ and three diagnostic variables, $w$, $\rho$, and $p$ in the model. Consistent with the requirements for integral constraints, the space-staggered grids are arranged in such manner that $T$, $S$, and $\rho$ are basically computed at the integer grid points $(i,j,k)$; $u$, $v$ at the half integer points $(i+1/2, j+1/2,k)$; $w$ at the $(i,j,k+1/2)$ points. The stream function $\psi$ is two-dimensional and is computed at the $(i,j)$ points. All variables are subscripted according to their spatial positions and are superscripted with the time step $n$, e.g., $T^n_{i,j,k}$. The horizontal placement of variables is also shown in Figure 3. All variables needed at points other than the basic grid points during the computation process are usually defined by the average values of the parameter at the immediately available points surrounding the temporarily required point. For example,

$$u_{i+1/2,j,k} = \overline{u}^{j}_{i+1/2,j,k} .$$

Momentum equations. The finite difference equations analogous to (37) for the x-component of the vertical shear current with respect to the $(i+1/2,j+1/2,k)$ subvolume can be written as,

$$(u'\sigma)^{n+1} - 2b\Delta t f(v'\sigma)^{n+1} = A \qquad (49)$$

where $b$ is the implicit stabilizing factor for the Coriolis terms, $\Delta t$ the unit time step and

$$A = (u'\sigma)^{n-1} + 2\Delta t(1-b)\, f(v'\sigma)^{n-1} + 2\Delta t(B^n+F^{n-1}+G^n-\hat{U}) . \qquad (50)$$

The pressure gradient force is approximated from density alone according to (29) as,

$$B = -\delta^i(\bar{p}^j)\,\frac{A_1}{\rho_o} \tag{51}$$

where

$$P = \begin{cases} 0, & k = 1 \\ \displaystyle\sum_{k=1}^{K-1} \overline{\rho}^k_{k+1/2}\, g\Delta z_{k+1/2}, & k = 2,\ldots,K \end{cases} \tag{52}$$

The friction terms, according to (11) are,

$$F = \frac{\nu_1 A_1}{\Delta x}\,\delta^i(\delta^i u) + \frac{1}{\Delta y}\,\delta^j(\nu_1 A_2 \delta^j u) + \frac{\delta^k}{\Delta z}\,(\nu_2 A_3 \delta^k u)$$

$$+ \nu_1 \left[ (1-\tan\phi)\,\frac{u\sigma}{a^2} - \frac{2\tan\phi\; A_1 \delta^i(\bar{v}^i)}{a^2\cos\phi} \right]. \tag{53}$$

The nonlinear terms, according to (1) and (35) are,

$$G = -\delta^i\{\bar{u}^i\overline{[(\overline{\bar{u}^i A_1})^i]}^j\} - \delta^j\{\bar{u}^i\overline{[(\overline{\bar{v}^i A_2})^j]}^i\} + \delta^k\{\bar{u}^k\overline{[\bar{w}^j A_3]}^i\} - uv\delta^j A_2 \tag{54}$$

Note that the right-hand side of (54) excluding the last term, is the negative form of the flux operator $\mathcal{L}$. The vertically averaged term is

$$\hat{U} = \frac{1}{D}\sum_{k=1}^{K} (B^n + F^{n-1} + G^n)\Delta z_k \quad . \tag{55}$$

A prognostic equation for the v'-equation according to (38) is,

$$(v'\sigma)^{n+1} + 2b\Delta t f(u'\sigma)^{n+1} = A^* \quad , \tag{56}$$

Where $A^*$ is similar to A; $B^*$, $F^*$, $G^*$ are similar to B, F, G; and $\hat{V}$ is similar to $\hat{U}$.

Thus, the shear current at all half grid points (1+1/2, j+1/2,k) is,

$$(u')^{n+1} = G + 2b\Delta t f G^* / (1 + 4b^2(\Delta t)^2 f^2)\sigma \tag{57}$$

$$(v')^{n+1} = G^* - 2b\Delta t f G / (1 + 4b^2(\Delta t)^2 f^2)\sigma \tag{58}$$

Notice that in (57) and (58) the basic time differencing scheme used in the model is the leapfrog scheme. This time scheme can cause the temporal "splitting" phenomena in the solution for a long-term integration process (Lilly, 1965). Therefore, the implicit backward time scheme (Matsuno, 1966) is periodically used every 25 time steps. The Coriolis term is treated implicitly which permits a time step longer than the inertial period (Bryan, 1969b). For linear computational stability, a stabilizing factor b is chosen to provide a slight damping of inertial oscillations, b = 0.55 is used for the present run.

The finite difference vorticity equation with respect to (i,j) points according to (34) is

$$\nabla^2(\psi D)_t = \delta^i \left[\overline{\frac{1}{\Delta x}(\hat{G}^*+\hat{F}^*)}\right]^j - \delta^j \left[\overline{\frac{1}{\Delta y}(\hat{G}+\hat{F})}\right]^i - \frac{1}{2}\delta^i f \delta^{2i}\psi \qquad (59)$$

where G, F, G*, F* are the vertically averaged mean of $G^\lambda$, $F^\lambda$, $G^\phi$, $F^\phi$ equivalently shown in (53) and (54), $\delta^{2i}\psi$ indicates the derivative of center difference with a separation of $2\Delta x$, and

$$\nabla^2\psi = \delta^i\left[\overline{\frac{\Delta y}{\Delta x}\delta^i(\overline{\psi})^j}\right]^j + \delta^j\left[\overline{\frac{\Delta x}{\Delta y}\delta^j(\overline{\psi}^i)}\right]^i . \qquad (60)$$

This is a nine-point finite difference Lapacian operator which can easily be reduced to a five-point Lapacian operator if $\Delta x = \Delta y$. With $\psi_{i,j} = 0$ on all lateral boundaries, (59) is solved by over-relaxation in the interior with an initial guess of $\psi_t = 0$. The $\psi^{n+1}$ is advanced from $\psi^{n-1}$ in pace with the same time step used for the vertical shear current.

The vertical mean velocity, with respect to the computed points (i+1/2,j+1/2) is,

$$\hat{u} = -\delta^j(\overline{\psi})^i/\Delta y \qquad (61)$$

$$\hat{v} = \delta^i(\overline{\psi})^j/\Delta x \qquad (62)$$

The vertical velocity (w) can be obtained from the continuity equation with respect to the (i,j,k) subvolume index as (i,j,k+1/2),

$$w_{k+1/2} = w_{k-1/2} - \frac{\Delta z}{\sigma}\left[A_1\delta^i(\overline{u}^j) + \delta^j(A_2\overline{v}^i)\right] \qquad (63)$$

where $w_{i,j,\ 1/2} = 0$ at the surface. Note that the vertical velocity is diagnostically defined at the top and bottom surface of the subvolume under consideration.

It has been shown (Huang, 1973) that there is no false source or sink of kinetic energy using the above finite difference scheme indicated above.

Temperature and salinity equation. The temperature and salinity are calculated at all integer grid points (i,j,k). The finite difference form of the thermal energy equation is

$$(T\sigma)^{n+1} = (T\sigma)^{n-1} + 2\Delta t[Q^n + (Q^*)^{n-1}] \tag{64}$$

where

$$Q = -[A_1\delta^i(\bar{T}^i\bar{u}^j) + \delta^i[A_2\bar{T}^j\bar{v}^i] + A_3\delta^k(\bar{T}^k w) \tag{65}$$

and

$$Q^* = \frac{\kappa_1 A_1}{\Delta x_j}\,\delta^i(\delta^i T) + \frac{1}{\Delta y}\,\delta^j[\kappa_1 A_2\delta^j T] - A_3\delta^k[\frac{\kappa_2}{\Delta z_{k+1/2}}\,\delta^k T]\ .$$

The eddy diffusivities may be treated as parameters depending on j and k.

Similarly, the finite difference equation for salinity analogous to (7) has exactly the same form if S is substituted for T. The only source and sink for the potential energy in the ocean domain, excluding the small portion internally transformed from the kinetic energy, are the heat and water input through the naviface and the diffusive dissipations.

Boundary conditions. All the mesh grid points on the solid lateral boundaries, which are approximated by the meridians and by the latitude circles passing through the nearest integer grid points, coincide with calculating points $\psi$, T, and S. Understanding that the two dummy indices are not specified, the zero flux condition at all solid boundaries lead to

$$q_{\ell+1} = q_{\ell-1} \tag{66}$$

where q is the variable (T,S) computed at the boundary and $\ell$ is the index normal to the boundary at the boundary such as i*, I, and J. However,

$$\psi_{i,j} = 0 \tag{67}$$

at all lateral boundaries. The no-slip boundary condition leads to

$$(u,v)_{\ell+1/2} = -(u,v)_{\ell-1/2} \quad . \tag{68}$$

However, the free slip boundary condition is also used for the longitudinal flow at the southern boundary. That is, for j indices,

$$(u,v)_{1/2} = (u,-v)_{3/2} \tag{69}$$

The downward fluxes of heat, water, and momentum through the naviface are parameterized as the upper boundary conditions indexed at k = 1/2,

$$\frac{\kappa_2}{\Delta z_{1/2}} \delta^k T_{1/2} = \frac{Q_s}{\rho_o C} , \tag{70}$$

$$\frac{\kappa_2}{\Delta z_{1/2}} \delta^i S_{1/2} = S_1 (E-R) , \tag{71}$$

$$\frac{\nu_2}{\Delta z_{1/2}} \delta^k (u,v)_{1/2} = (\frac{\tau^\lambda , \tau^\phi}{\rho_o}) . \tag{72}$$

Hydrostatic stability. At places where excessive upward heat flux occurs and where evaporation exceeds precipitation by a large amount, a layer of heavy cold and salty water will be formed in the upper layers of the ocean. Whenever the local density lapse rate is less than the vertical lapse rate, which will ensure a marginally stable vertical density distribution, a hydrostatic instability exists in the adjacent layers. Since instability in the real ocean usually lasts for a short period of time, an instantaneous convective adjustment mechanism is activated in the model. Let

$$\gamma_\rho = -\left(\frac{\rho_{k-1} - \rho_k}{\Delta z_{k-1/2}}\right) \tag{73}$$

be the equivalent density lapse rate between layers. A small positive value, $\varepsilon_\rho$, is assumed since a slight inversion in density within the marginal stable limit may exist. In the model the lapse rate between layers is computed and compared with $\varepsilon_\rho$. If

$$
\begin{aligned}
-\gamma_\rho &> \epsilon_\rho \qquad \text{stable} \\
-\gamma_\rho &< \epsilon_\rho \qquad \text{unstable}
\end{aligned}
\tag{74}
$$

where $\epsilon_\rho$ is estimated from the average density distribution in the ocean. Assuming that the temperature and salinity contributions to the density variation are equally important, the marginally stable criteria for temperature and salinity can be estimated from $\epsilon_\rho$ and the coefficients for temperature and salinity expansions in the mean state of ocean. When instability is detected between layers, the temperature, salinity, and density in these vertical layers are mixed into quasi-homogeneity. For instance, if instability exists in layer k-1 and k, the adjusted temperature will be

$$
\begin{aligned}
T_k^* &= \frac{T_k \Delta z_k + (T_{k-1} - \epsilon_T \Delta z_{k-1/2}) \Delta z_{k-1}}{\Delta z_{k-1} + \Delta z_k} \\
T_{k-1}^* &= T_k^* + \epsilon_T \Delta z_{k-1/2}
\end{aligned}
\tag{75}
$$

where the superscript * indicates the adjusted value after mixing and $\epsilon_T$ is the marginal stable criterion for temperature. These stability criteria and adjusting processes are applied to all layers in the column. The procedure is repeated whenever there is more than one unstable subcolumn until stability has been reached for the whole column.

## 4. Model Performance

Flexibility and efficiency. In simulation studies using finite difference schemes for long-term integrations, the conservation of integral properties and the accuracy of solution in the statistical sense are essential considerations. The flexibility in choosing grid separations and the efficiency in carrying out the computation are also important factors in designing numerical experiments.

For the flexibility of the model, we have programmed in such a manner that the whole domain is computed in a sequence of blocks which consist of many computational boxes independent of vertical layers. We are able to execute the experiment with one version of the model which possesses reasonably small space separations, as small as 20 km in both longitudinal and meridional directions with as many layers as necessary. This is important in the long run for our purpose of carrying out much-finer-mesh experiments in the later stage of our investigation which may involve the meso-scale dynamics.

We also think our algorithm and computational sequences are optimized in such a manner that most unnecessary recurrent computations such as derivatives and areas are computed only once in the starting run. Restarting the model run from one specified day to another as well as the selections of climatological output either on tape or in print for any time

interval can be handled conveniently. Because it is independent of vertical layers, the model may have as many vertical layers as necessary. The present version employs ten vertical layers. Depths of the ten levels in the 2.5-degree model are placed at 10, 30, 60, 100, 150, 225, 350, 700, 1500, and 3000m, respectively, below the naviface and the constant maximum depth of the ocean is assumed at 4000 m as shown in Figure 2. It is obvious that much emphasis has been placed on the column of water above the permanent thermocline.

Integration programs. The present version of the NORPAX model is written in FORTRAN and has been executed on NCAR's CDC 7600 machine. With horizontal separations of 2.5°, the North Pacific domain is divided into three blocks of many 23-by-27 arrays. The model requires a 48.7 K core memory and about 14 seconds of CPU time in CDC 7600 for each simulated day. With CDC's 60 bytes of accuracy, all computations are performed in single-precision arithmetic.

At the beginning of the spin-up stage, the model ocean is motionless with a selected, layered, homogeneous density pattern. Together with the controlling and monitoring constants, all the specifications for the configurations of the model such as grid separations, layer thicknesses, ocean depths, indexes for computational points and others are entered for the "cold start." The atmosphere forcing functions for the annual mean steady state are also entered at the beginning. The seasonal varying forcing boundary conditions are, of course, stored in a file and fed into the model at each specified time interval at the

later stage of integration. A constant file is generated in the first iteration which stores all constant parameters as well as derivatives and cross-sectional areas which are not a function of any variables such as temperature, velocity.

One of the most important set of constants in the constant file is the indices which designate the surrounding boundary conditions of the computational point. Indices for the regular and irregular points are summarized in Figure 4. All interior points bear the index of 0 while all boundary points are non-zero positive numbers (1-12). The land points which are not in the domain of interest have a negative number index smaller than -10. All positive indexed points are treated differently in accordance with the boundary they represent. The artificial boundaries between the blocks are indexed by a small negative number (-1, -2, -3, -4 for the two ficticious boundaries of one block's domain). The domain of interest is divided into three blocks as shown in Figure 5. Computations are carried out in each time step by sequence.

The main computational control is in the subroutine MAINCL where six temporarily assigned files are called as formal parameters. The last two files are used to store the vertically integrated data for the relaxation method in solving the vorticity equation. The remaining four files control the rotary input and output of values of all variables for the previous, present, and advanced time stop. The rotary manipulation of files in the subroutine MAINCL are briefly demonstrated in Figure 6. As we recall, for example, the advection terms in

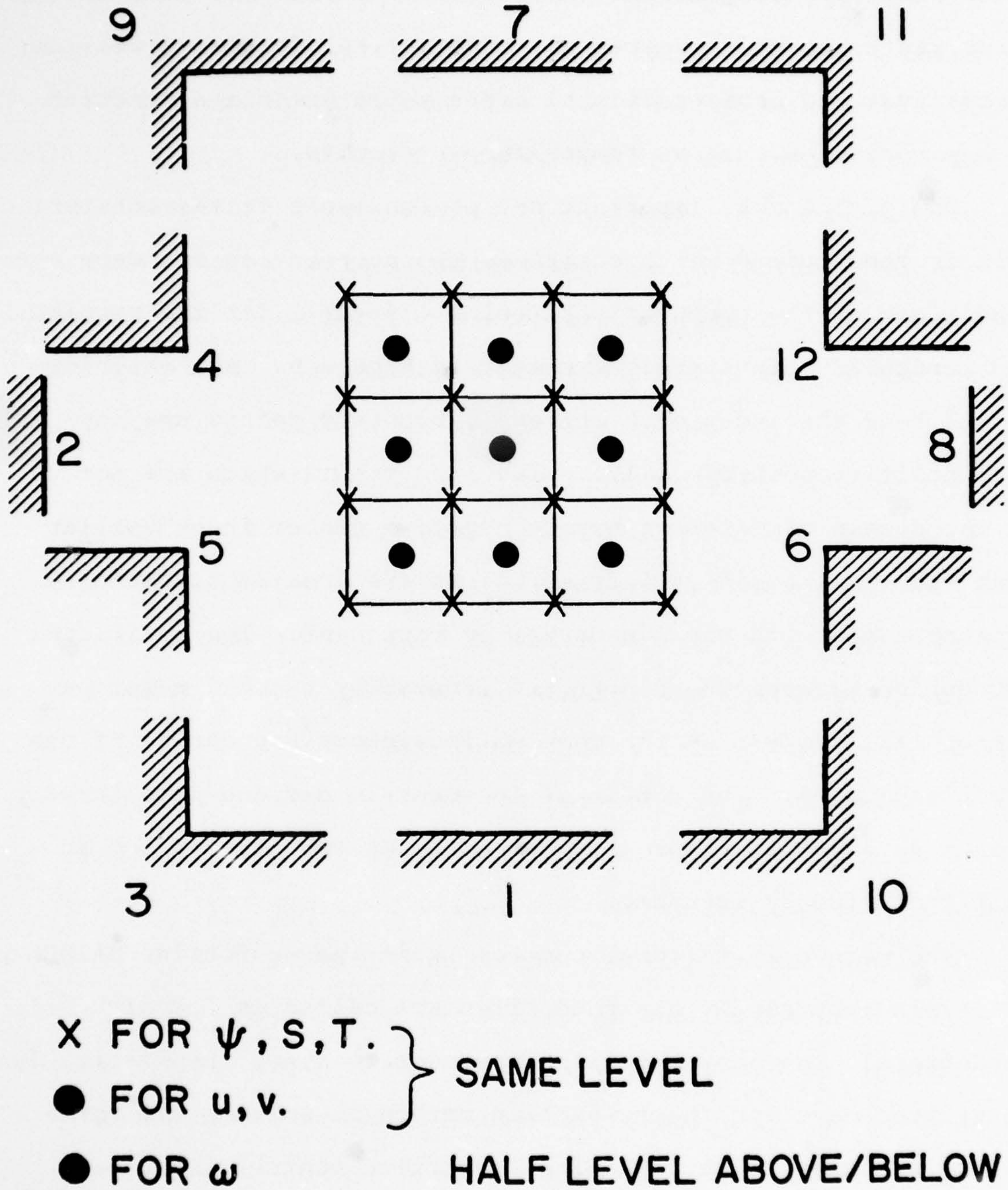


Figure 4. Indices for irregular boundary points and relative locations of variables.

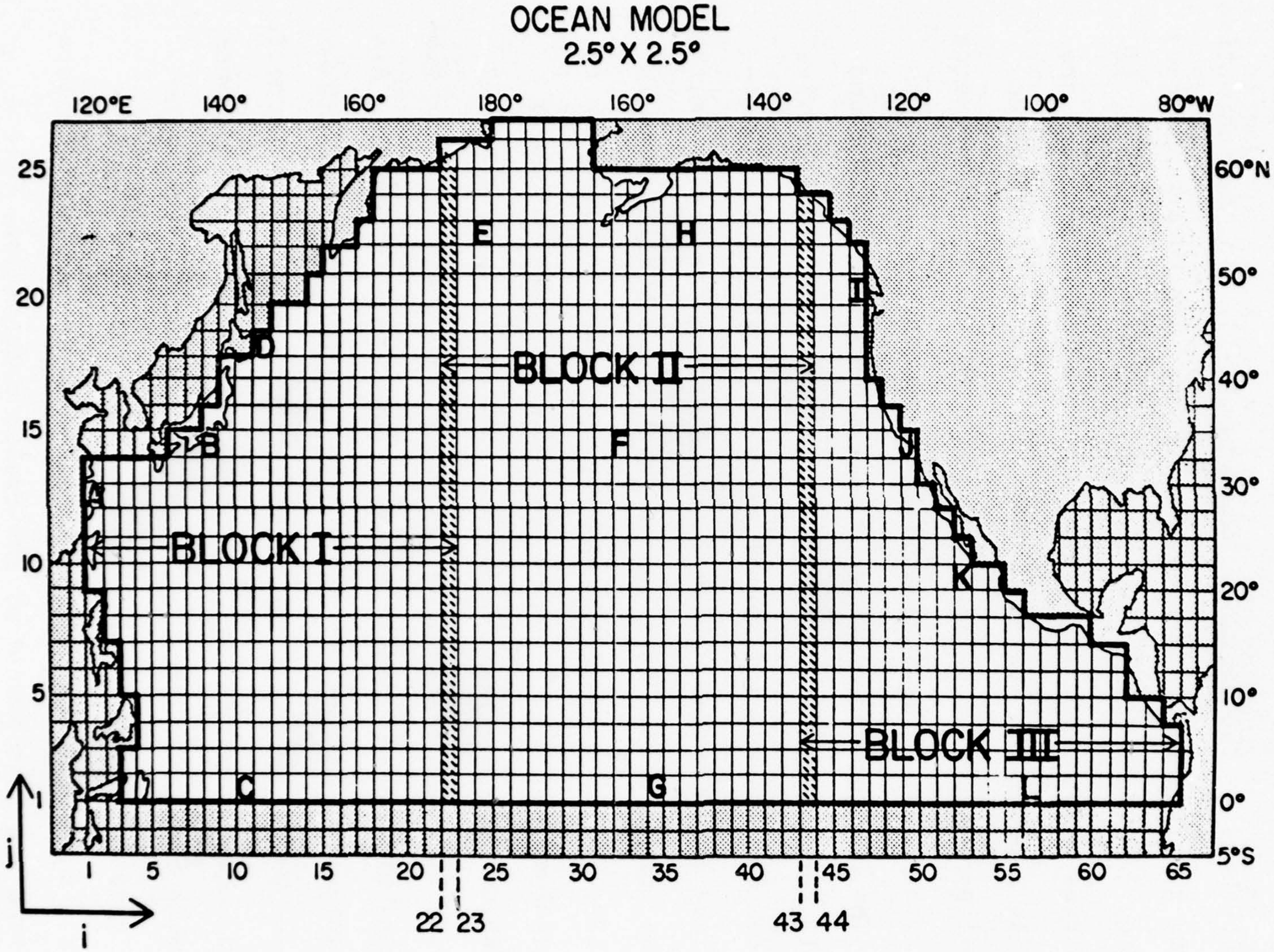


Figure 5. Block separations of the ocean domain and their respective fictitious boundaries.

the momentum and heat equations are computed with respect to the present (n) time step while the diffusion terms are computed with respect to the previous time step (n-1). In the subroutine MAINCL the file parameters fp, fx, fy, fz, are rotary assigned to four temporary files, say 1, 2, 3, and 4. For example, if at a time step n, variable values for the (n-1) time step are in file 1 and those for the n step are in file 2. Then the formal parameters in calling subroutine MAINCL are in sequence (1, 2, 3, 4, 6, 7) as indicated in Figure 6a.

The subroutine MAINCL will call subroutines ACALK32 and NONLIN for the advection terms, and FCALK32 for the diffusive terms. The sequence of formal parameters called at all subroutines is important. File 2, which stores the n-step values, is the input file in subroutines ACALK32 and NONLIN while in FCALK32, Files 1 and 3 are input files; file 1 stores the (n-1) step values and File 3 stores the rate of change values of variables from the previous output (NONLIN). In File 6 or 7, the vertically-integrated values are stored for use in the subroutine RELAX from which the stream function is obtained. All variables are advanced to (n+1) step in subroutine CNTX. Subroutine WUVCAL computes the vertical velocity and all energetic terms while subroutine WFLOUT checks the output. The sequence followed above completes one time step of computation. The next step in the cycle is indicated in Figure 6b. The previous n-step file (File 2) will be in the (n-1) step file location and the last output of the cyclic computation, File 3 from the subroutine WFLOUT, will occupy the n-step location.

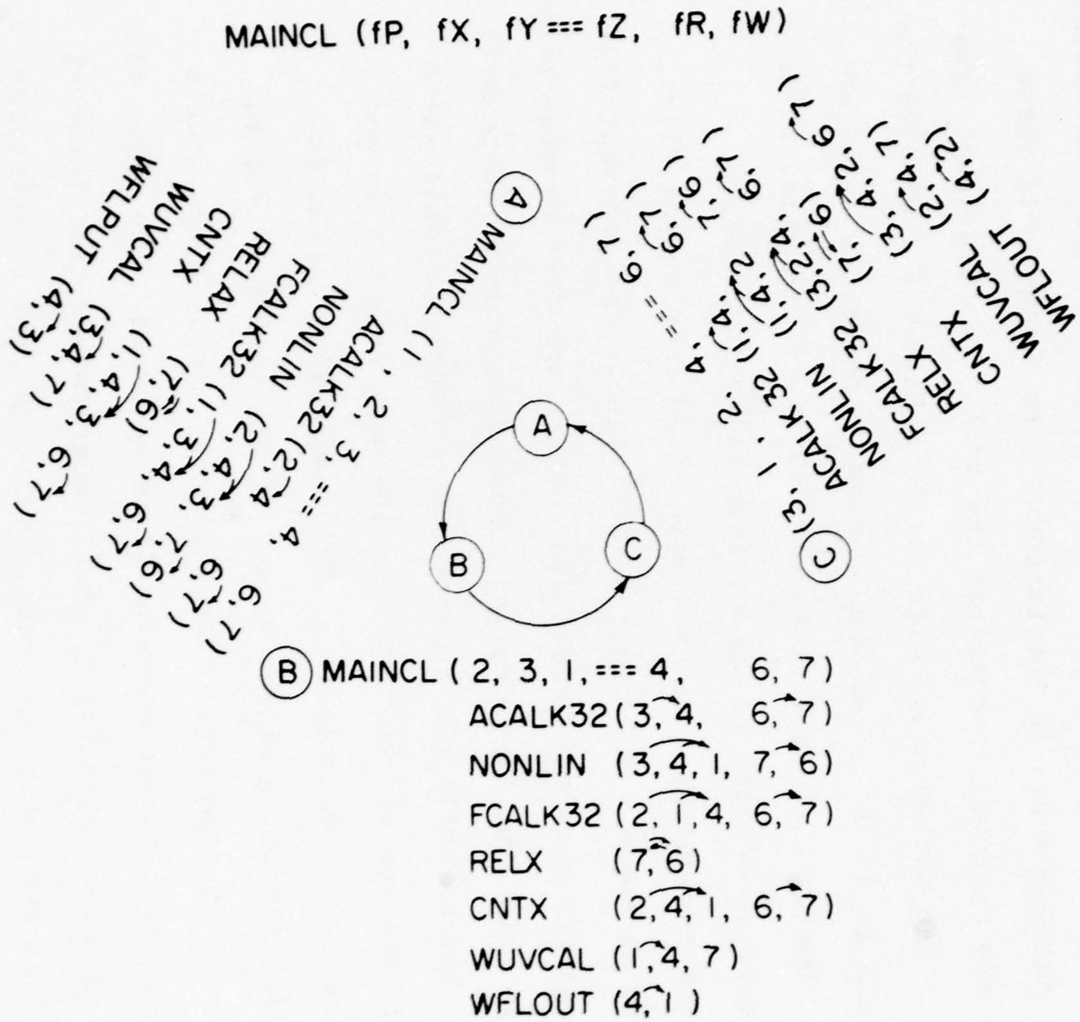


Figure 6. The rotary sequence of temporary files in the subroutine MAINCL.

In the second iteration, the formal parameters of subroutine MAINCL are (2, 3, 1, 4, 6, 7). For randomly accessible files such as those in the Extended Core Memory only three files are required to complete the cyclic computational rotations. The dotted equal sign (:::) in Figure 6 indicates the equivalence of two files when randomly accessible files are used. However, if tape files or disk files are used, it is much more convenient to employ four files in rotation.

For convenience, we have maintained four output files, usually on tapes. The first output file is the constant file which stores constant parameters. There are four records within this file; the first record contains constants independent of the blocks while the other three contain constants which depend upon the blocks. This is the most frequent in and out file during the computation. The second file is the restarting file which stores values of all variables for two time steps at a selected time interval. Thus, a continuous run is easily started whenever it is required. The third file keeps the model climatology at a predetermined time interval convenient for future analyses. A fourth file is maintained to store a continuous (every time step or every day) record of energetics for the entire basin and of values of all variables at specific locations. The energetics are: the total energy, the potential energy, the total kinetic energy, the barotropic energy, and the baroclinic energy. The selected points of special interest can be varied. We have chosen twelve points as indicated

by the alphabets in Figure 6. Detailed information about the integration program is presented in the Appendices.

Sample of model output. After 60 years of time integration, the model reached a quasi-equilibrium state under a mean forcing condition. Figure 7 shows a contour plot of the mass transport stream function under annual mean surface wind stresses and heating. Three large-scale gyral circulations are well developed, similar to the Munk solution (Munk, 1950). The anticyclonic subtropical gyre is realistically portrayed and the western intensification of the boundary current is clearly demonstrated. A major part of the mid-latitude west drift current constitutes the northern portion of the subtropical gyre. The California Current, the North Equatorial Current, as well as the Western Boundary Current are all included in this gyral current system. The maximum total transport in the Kuroshio region near Japan reaches 56 Sverdrups ($56 \times 10^6$ $m^3$/sec).

Two cyclonic gyres are also well simulated, one of which is in the subarctic region, the other in the tropic region. The subarctic cyclonic gyre consists of the west drift current, the Alaskan Current, the Aleutian Current with its extension through the Bering Sea, the Kamchatka Current, and the Oyashio Current. The mass transport of the model output in the Kamchatka Current region has a southward transport of 21 Sverdrups and about 2 Sverdrups in the Oyashio region. The mass transport in the tropical cyclonic gyre under the annual mean atmospheric forcing reaches a maximum value of 25 Sverdrups. The gross feature of the stream function patterns

# STREAMFUNCTION

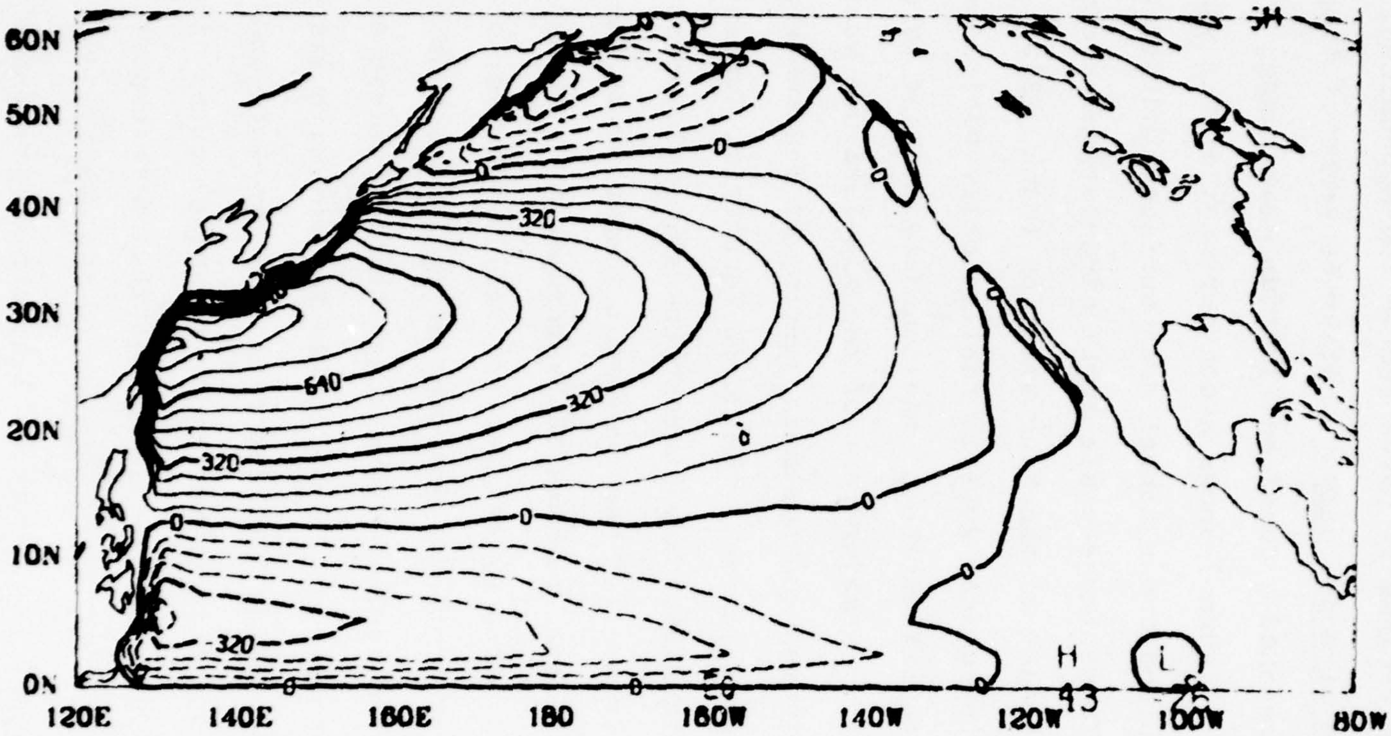


Figure 7. Contour plot of mass transport stream function in $10^6$ D $cm^3$/sec.

show a distribution similar to that of the wind stress curl. The barotropic current deduced from the stream function is generally small, less than 1 cm/sec everywhere in the basin, except in the western boundary region.

Figures 8a,b,c show current vector plots for the layers at a depth of 10 m, 250 m, and 2500 m, respectively. Figures 9a,b,c show streamline plots for these same levels. In the surface layer the major swift currents occur in the equatorial region as well as in the western boundary region. The maximum current is shown in the eastern central Pacific near the equator with a speed of 95 cm/sec. The Kuroshio Current only reaches 64 cm/sec due mostly to the course grid meshes. We notice that the western boundary current is only barely resolved at a horizontal separation of about 175 km. Thus, the coarse grid separations have led to smaller current values than the observed velocities while the transport values are comparable. The surface currents in the tropics generally flow westward. The equatorial countercurrent is not clearly shown, most probably a result of the coarse grid. The Oyashio merges into the extension of the Kuroshio to form the North Pacific drifting current. A streamline plot for the surface layer is shown in Figure 9a. It is evident that the surface is dominated by the wind pattern. In the equatorial region, the flow pattern splits into a northward branch to form the Kuroshio and a southward branch of the equatorial current system near the Phillipine Sea. The existence of the subarctic convergence zone is clearly shown along the mean track of the Kuroshio and

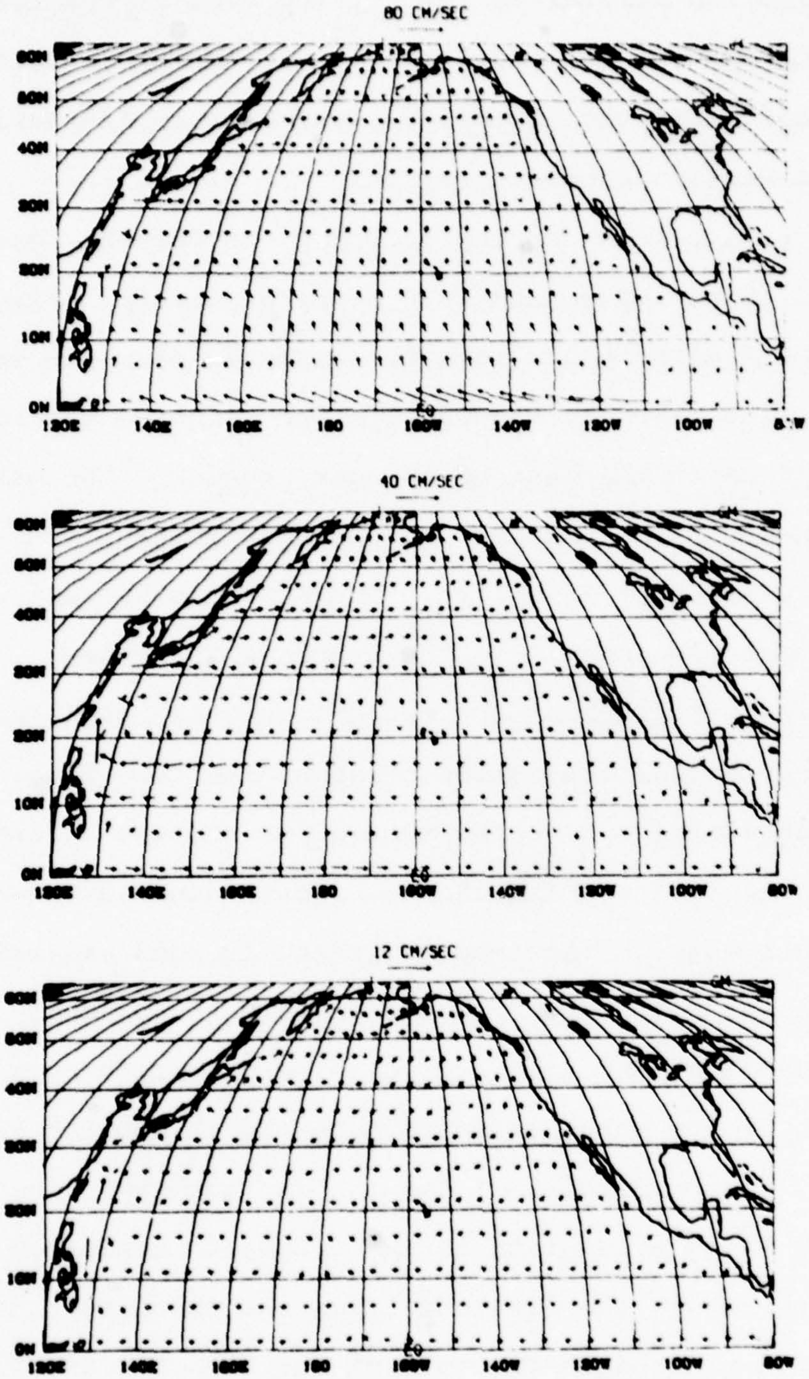


Figure 8. Current vector plots: (a) at 10-m depth; (b) at 250-m depth; (c) at 1500-m depth.

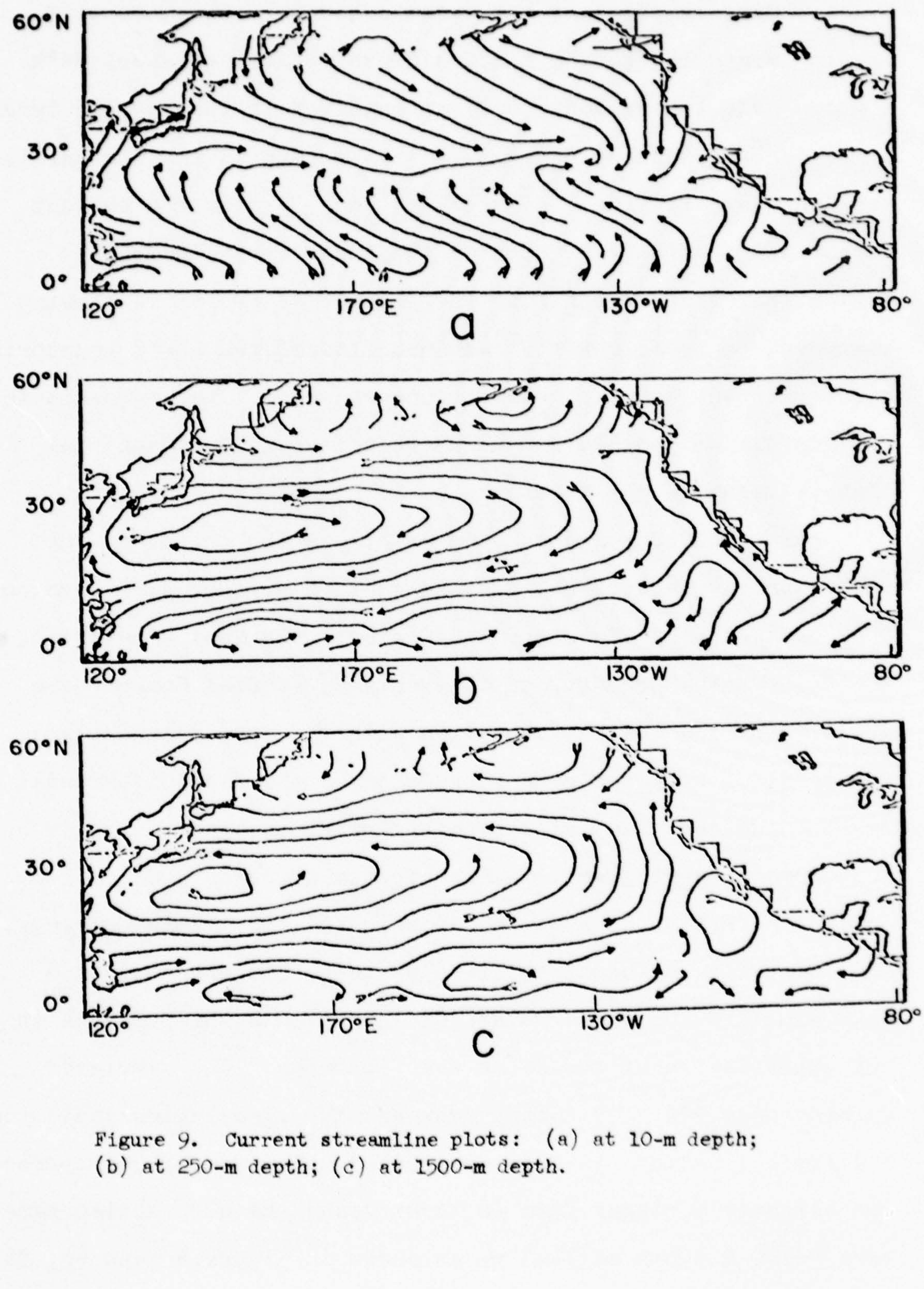


Figure 9. Current streamline plots: (a) at 10-m depth; (b) at 250-m depth; (c) at 1500-m depth.

Oyashio merging zone off the western boundary at about 40°N, leaning southward to the eastern North Pacific at about 35°N. A meso-scale anticyclonic eddy, recognized as the Eastern Gyral by Sverdrup (Sverdrup, et al., 1942), exists in the mid-latitude eastern North Pacific. Figures 8 and 9 show the current vector and a streamline plot of the layer at 250 m depth. Notice that the current near the equatorial region is flowing eastward, representing the combined flow of the north equatorial countercurrent and the Cromwell undercurrent. The Kuroshio is well developed and has a maximum velocity of 35 cm/sec, the highest value in the layer.

A surface convergence line exists at the center of the geostrophic gyre at 250 m and the eastern surface gyre does not show up at depth. The Kuroshio Current, the west wind drift, the California Current, and the North Equatorial Current are predominant and easily identified with the anticyclonic gyre. The tropical cyclonic gyre consisting of the North Equatorial Current and the equatorial countercurrent combined with the equatorial undercurrent, is clearly demonstrated. Other less obvious currents, such as the Oyashio and the Alaska Currents, are indicated in the circulation pattern. Figures 8a,b and 9a,b simulate the gross nature of the circulation patterns in the upper layers of the North Pacific Ocean. The simulated current near 700 m is rather weak and the circulation indicates a different pattern (figure not shown). The deep layer currents are slightly stronger than in layer 7 and the circulation pattern below a depth of 1500 m, as shown in Figure 8c and 9c, is

opposite that of the upper layers. The current beneath the Kuroshio is flowing southward at a much slower speed of 4 cm/sec and there is clearly a weak cyclonic circulation in the subtropical region. Deep water is slowly flowing southward from the high latitudes in the western North Pacific and northward in the eastern North Pacific which generally agrees with the deep circulation pattern deduced from the geostrophic calculations of Reid (1976, personal communication).

Figure 10 shows the vertical velocity contours at the bottoms of the aforementioned three layers (i.e., at 20 m, 300 m, and 2200 m in depth, respectively) in the model ocean. The solid contour indicates upwellings and the dotted line represents downwelling. There are, in general, strong upwellings along the equator, especially in the eastern part of the mid-tropic region where the maximum upwelling reaches 5 m/day. Upwellings in the mid-latitude western boundary region are relatively weak in the surface layer. There also exist weak upwellings along the California coast and in most subtropical and eastern tropical regions away from the equator. This pattern of equatorial upwellings and subtropic downwellings extends to a depth of more than 700 m. Upwellings along the western boundary and downwellings in the high latitudes and north-western part of the Nort Pacific become even stronger at a depth of 1500 m. The maximum upwelling reached 3.5 m/day in the western boundary at a depth of 200 m and a maximum downwelling of approximately 1 m/day occurred

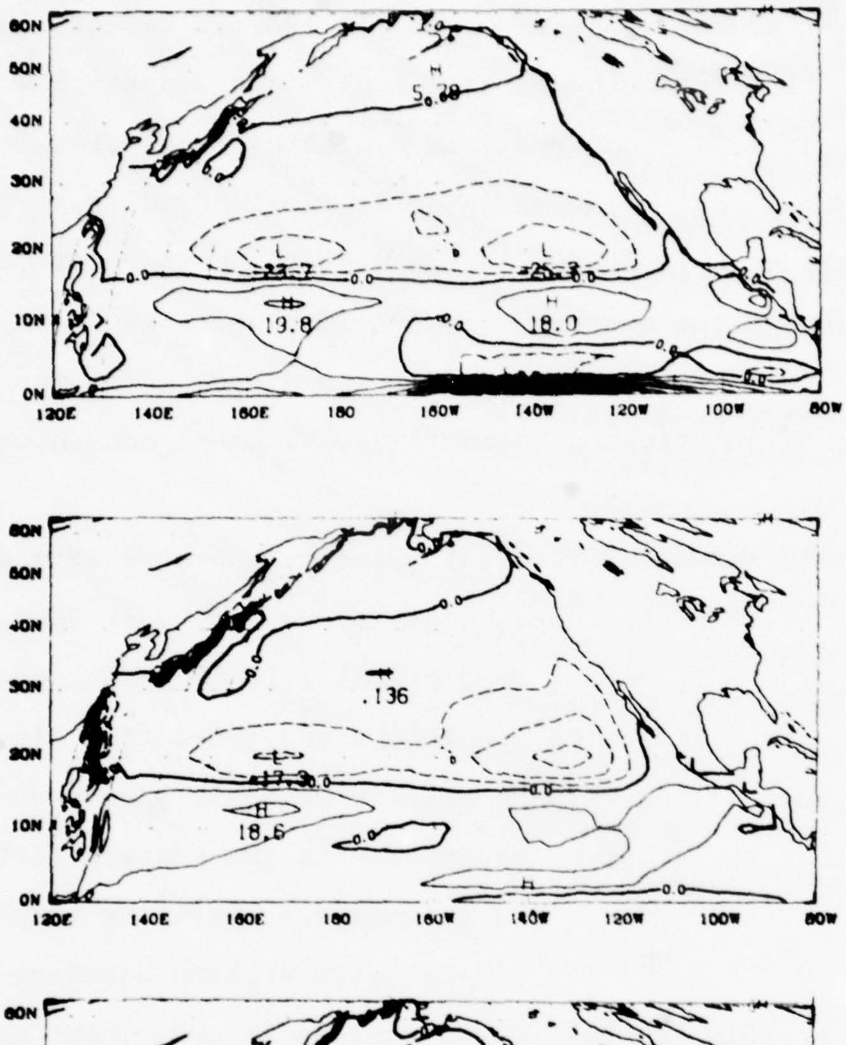


Figure 10. Vertical velocity contours at different levels in the North Pacific Ocean: (a) at 20-m depth; (b) at 300-m depth; (c) at 2200-m depth.

in the high latitude region at a depth of 550 m. The equatorial upwelling decreases below 200 m and a slight upwelling was indicated in the tropics at the 1500 m depth. However, below 1500 m, the general trend of upwelling and downwelling generally changed signs. Moderate downwellings exist at a depth of 1000 m in the western boundary and weak upwellings exist in the high latitudes. At a depth of 2500 m, weak upwellings become evident in most of the northern boundaries and moderate downwellings exist in the equatorial region. There are weak but broad upwellings in the interior of the tropics. From the previous figures we notice that major large-scale features in the model match nicely with observed mean current patterns and upwelling distributions in the North Pacific Ocean.

Figure 11 shows temperature patterns at depth of 10 m, 250 m, and 3000 m, respectively. The surface temperature distribution (Figure 11a) shows an equatorial cool region extending from the east boundary to $180^0$ which corresponds to the equatorial upwelling region. The broadest cold water area extends to $5^0$N with a minimum of $23^0$C at the equator. There is a broad warm water region in the western tropic and a narrow one near the eastern boundary north of the equator. A sharp meridional temperature gradient exists in the mid-latitudes off the western boundary along $35^0$N. The upwelling along the equator does not penetrate deeply around 300 m, warm water masses in the western and eastern tropics can still be clearly discerned, and a sharp temperature gradient

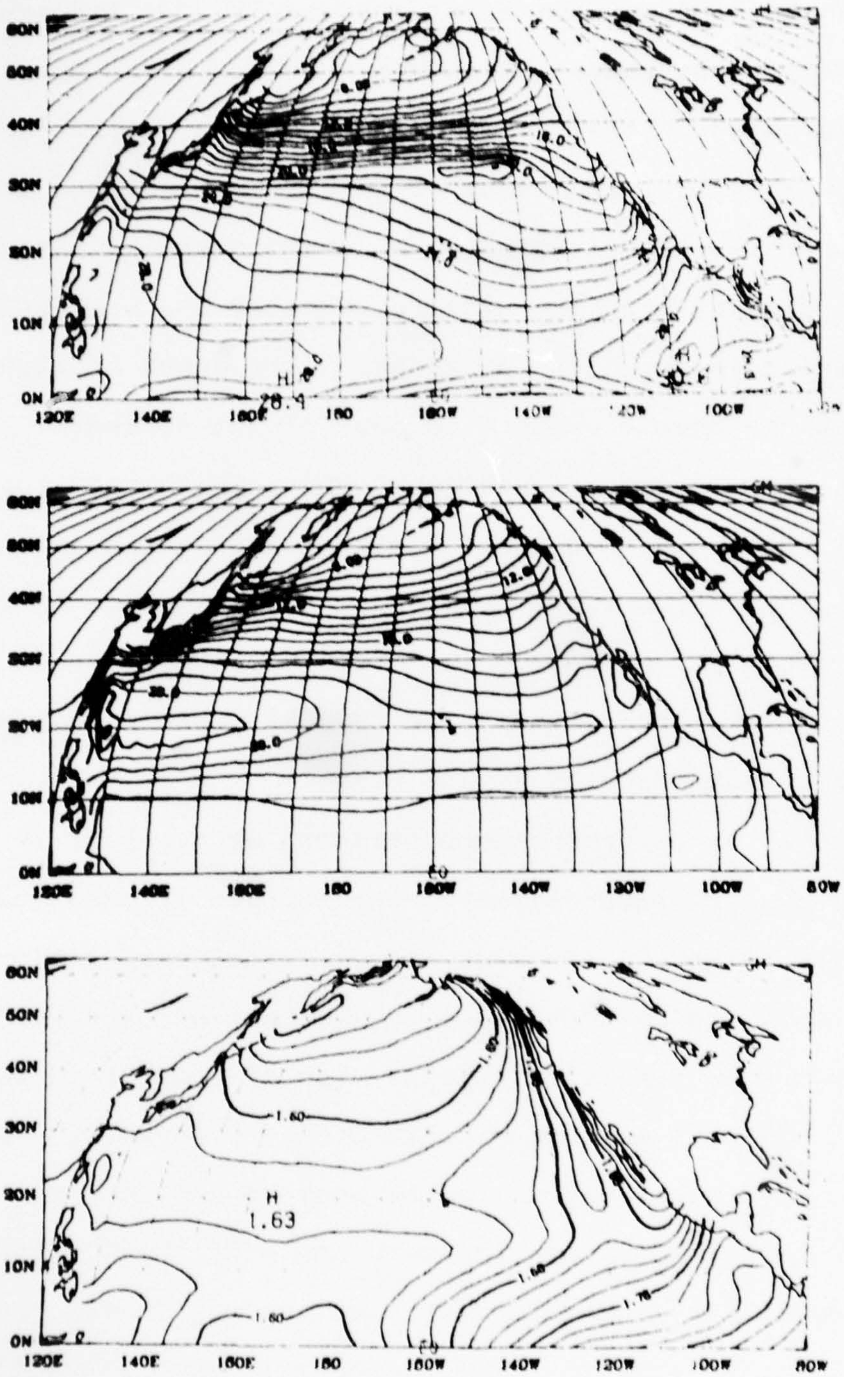


Figure 11. Temperature distribution at different layers: (a) 10 m; (b) 250 m; (c) 3000 m.

develops along the western boundary. At 1000 m (figure not shown), the temperature is quasi-homogenous and slightly warmer in the south. The deep water at 3000 m shown in Figure 11c indicates a spatial homogeneity with a slight cooling in the north.

Simulated salinity distributions for three layers (at surface, 350 m, and near bottom (3000 m)) are shown in Figures 12a,b,c, respectively. The surface salinity shows an elongated maximum zone above 35‰ between 20°N and 30°N which declines polarward and equatorward as indicated in Figure 12a. In the eastern tropics, there is also a high salinity tongue near the boundary and extending westward and a north-south homogeneity is indicated in the western boundary region. At the depth of intermediate water level, salinity values are slightly higher, around 34.4‰ to 35.2‰, than the surface layer but have a similar pattern as shown in Figure 12b. The salinity in the bottom water is rather homogenous with a slight high in the northwest.

The energetic diagram showing the magnitude and direction of work done per unit volume in ergs $cm^{-1}$ $day^{-1}$, the total potential energy, and the total barotropic and baroclinic energy in $erg/cm^2$ is shown in Figure 13. Potential energy is computed with reference to the ocean bottom. It is clear from Figure 13 that the kinetic energy, from both the barotropic and baroclinic modes, has reached a steady state while the potential energy is still losing energy at a rate of 2.5 $ergs/cm^3/day$.

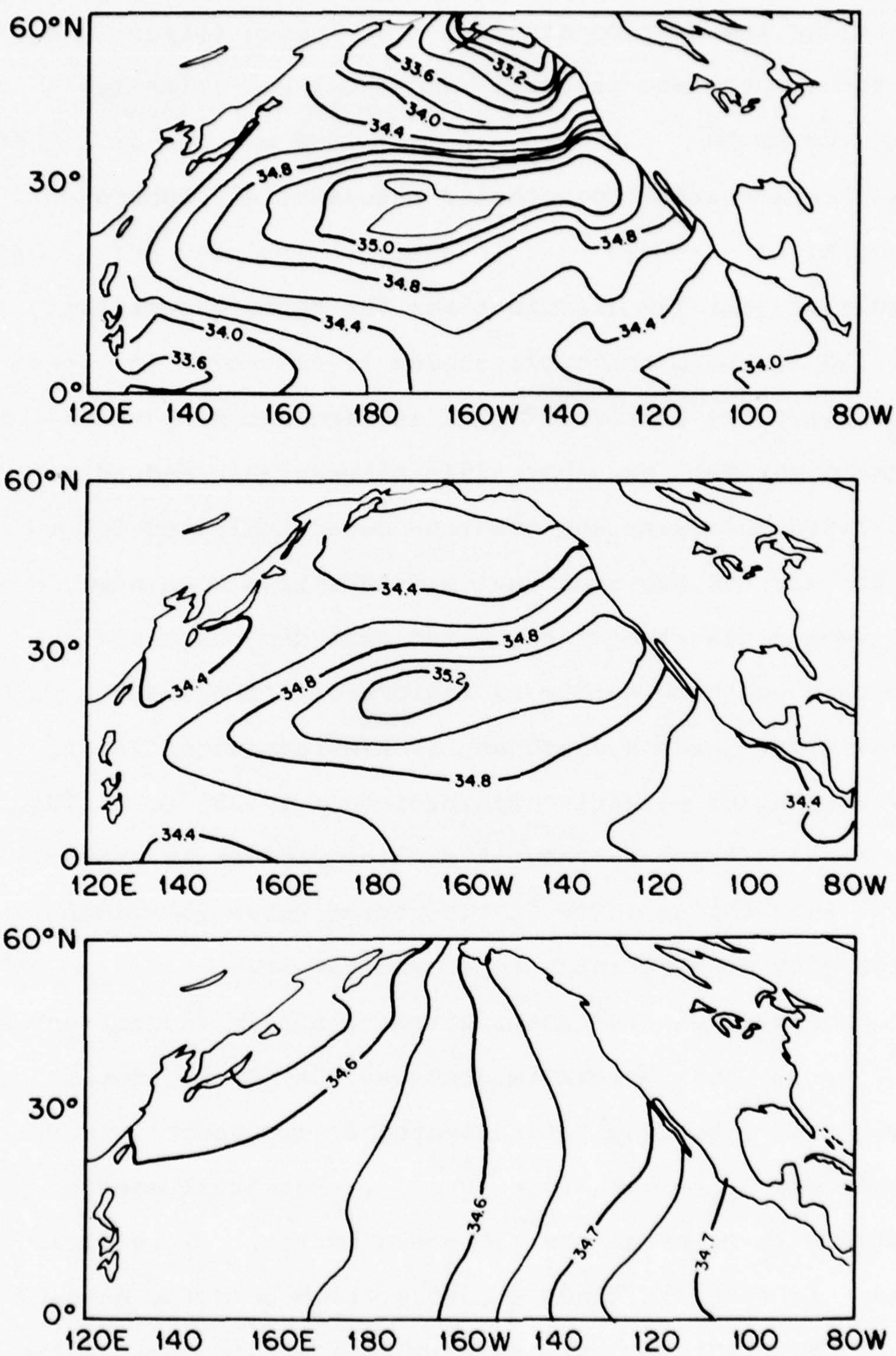


Figure 12. Salinity distributions of layers at depths of (a) 10 m; (b) 250 m; (c) 3300 m.

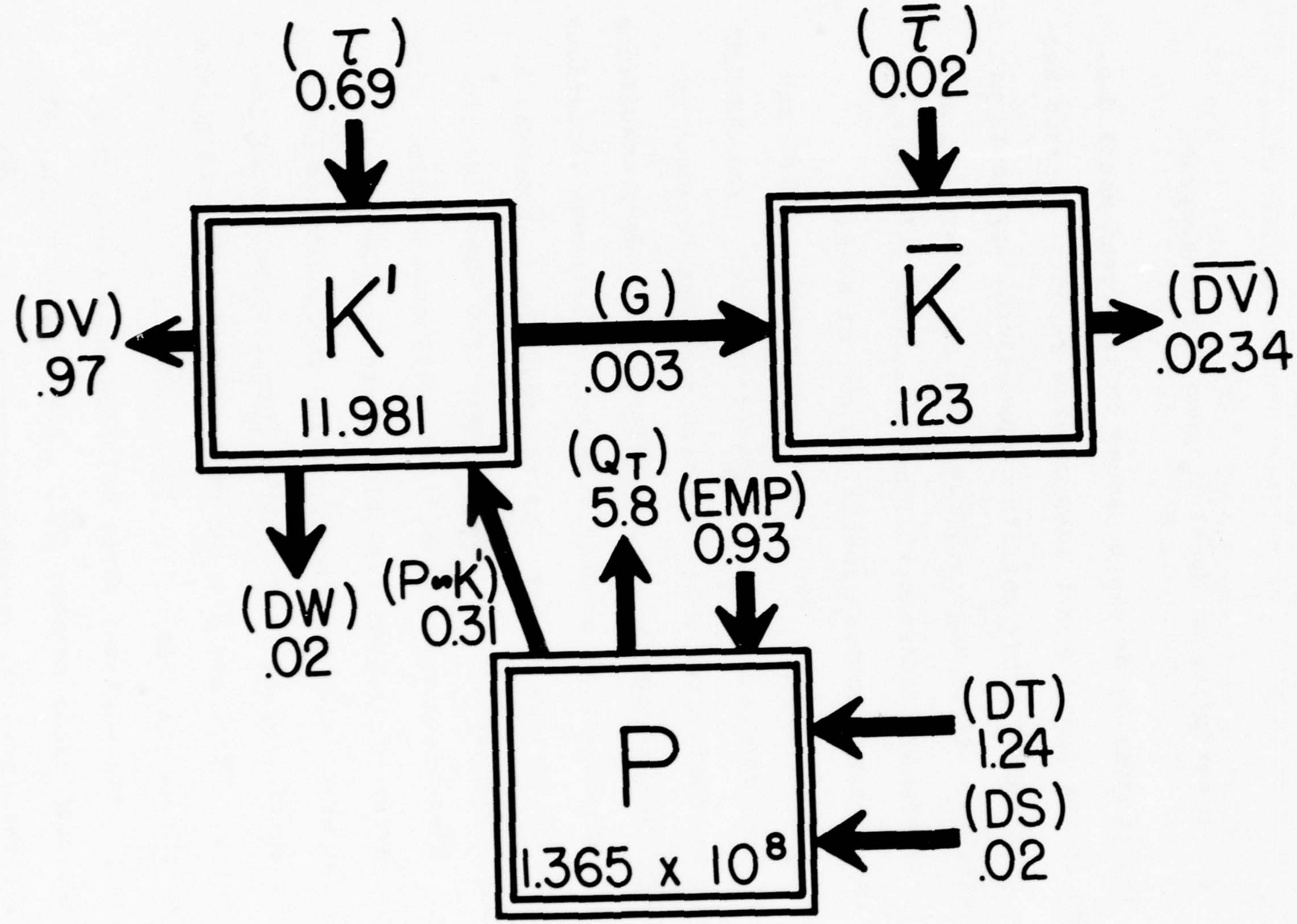


Figure 13. Energetic diagrams in the NORPAX model. Units for energy are ergs/$cm^3$, and for the rate of energy transformation, ergs/$cm^3$/day.

## 5. Description of Model Program and Subprograms

The program is developed based on the ocean model described in the previous sections of this report. In this section, program structure and its computational applications are detailed. Since major computations are undertaken at NCAR, the program controls will be documented in accordance with the system operation specifications at NCAR.

Deck Description. Two separate programs, OCENLNZ and TOCNLNZ, are made available for the ocean model. The OCENLNZ is used to compute the long-term mean atmospheric state of the North Pacific at the air-sea interface boundary conditions. The TOCNLNZ program is used to compute the seasonal variations. A flow chart of the two programs is presented in Appendix A.

The North Pacific Ocean is divided into three identical blocks. Each block contains 621 (23 × 27) grid points. Along the boundaries of the adjacent blocks are four artificial boundaries which will be removed during the unblocked process. In the execution phase, the program computes each block independently. There are a total of 1755 (65 × 27) grid points covering the entire ocean.

The program contains three major commons (CMN1, CMN2, CMN3) and four minor commons (NLCM, BDYL, ENSL, QTST). All control parameters, all variable change rates (e.g. $\frac{\partial V}{\partial t}$), and all vertically integrated quantities are stored in common

/CMN1/. This requires 6,600 decimal locations. Common /CMN2/ stores all constants, including overall used constants (about 2812 decimal locations) and block-dependent constants (about 2013 decimal locations). Common /CMN3/ stores three levels of prognostic variables, namely, $\psi$, u, v, w, S, T, and requires 9942 decimal locations.

The four minor commons are principally set up for convenience. Common /NLCM/ stores all LCM-related information. Common /BDYL/ stores the four fictitious boundary values. Common /ENSL/ stores all energetic terms and the values of all prognostic variables at the points selected. Common /QTST/ stores the seasonal varying atmospheric boundary conditions.

## Data Structure and Tape Manipulations

Four groups of tapes serve as binary input/output data storage for OCENLNZ and TOCNLNZ. For an initial run or a run with the intention of rebuilding the constant file, the data set which is needed for generating the constant file has to be input by cards following the designated control parameter cards. A regular restart run may be initiated with only a set of control parameter cards since all necessary information such as boundary conditions and initial conditions are self-provided in these input/output files.

Four separate records are contained in the constant file for the program OCENLNZ (or TOCNLNZ). Record 1 stores all block-independent data, from DAYB to TBISX(27) in the common /CMN2/, and has a length of 3082 words (2812 for TOCNLNZ). The second record

stores constants and parameters relative to block 1, from IBI to the end of common /CMN2/. This record has a length of 5118 words (2013 for TOCNLNZ). The structure of records 3 and 4 is identical to that of record 2 and they store constants and parameters relative to blocks 2 and 3, respectively. In TOCNLNZ, an additional 66 records follow those listed above. Record 5 stores Fourier coefficients for latitude dependent data and is 270 words long. Records 6 through 70 store Fourier coefficients for Ta, ea, Ug, and Vg and is 540 words in length.

Data in the history starting file are used as initial conditions for restarting a run. Each group record contains all variables ($\psi$, u, v, w, S, T) for every grid point. Since the leap-frog scheme is used here, values of two time-steps are required to start the computation. Two consecutive group records (at $t = t_i$ and $t = t_i + \Delta t$) form a restarting file to initiate a continuous computational run. At each time-step, 33 records led by the appropriate identification words are used to store all necessary data and are arranged in the following manner. For records 1, 12, and 23, word 1 denotes the model simulation day; word 2 holds the date of record creation; word 3 contains the block number (1, 2, or 3); and words 4 through 624 contain stream function values for 23 × 27 grid points. In records 2 through 11, 13 through 22, and 24 through 33, the first word denotes the layer number while words 2 through 3106 contain (23 × 27) × 5 values of variables u, v,

w, S, and T for the layer indicated in word 1. Plase note that two consecutive group records for the 2 time-step values (66 records total) are always necessary to restart a run. Periodic outputs of the starting file are provided at specific time intervals as protection against machine malfunction.

The data structure of the history output file (OCENLNZ and TOCNLNZ) is identical to the history starting file. The time interval of the history output file printout is specified in the control parameter cards.

The energy and selected point file allows the program output five energy values: deviated kinetic energy, vertical mean kinetic energy, total kinetic energy, potential energy, and total energy (sum of potential energy and kinetic energy). This file also contains values of all variables ($\psi$, u, v, w, S, T) at specific points which can be selected through control parameters. The structure of a single record is as follows: model simulation day, date of run, and energy values (1-5) followed by values of $\psi$, u, v, w, S and T. The length of the record is $7 + m \times 5 \times 10 \times 3 + m \times 3$ or 153 m, where m is the number of points selected in each block. One record for each specified time interval in the output of this file is necessary for program OCENLNZ. Three additional records which store the data of Ta, Qt, Tx, and Ty at $t = t_{output}$ are printed for program TOCNLNZ. Their leading words are Day, Date, and Block Number followed in order by Ta, Qt, Tx, and Ty. These three additional records have a length of 2487 words. In

TOCNLNZ, the three additional records are followed by the energy record.

Two types of output are formed for each run in addition to the binary files. The first output contains relevant information generated by input control parameters and is listed in the printout where energy tables and plotting will also appear. Optional outputs due to input control parameters such as starting file and constant file are also available. The second output contains a tabulated form of variables ($\psi$, u, v, w, S, T) at each grid point for a specified time interval which can be produced in the form of microfilm through DD80.

Routines Summary

Subroutines used in the simulation will be briefly described in this section. We have classified these subroutines into three categories: 1) control and execution routines; 2) input/output data, display, and file manipulation routines; and 3) plotting routines.

During the control and execution routine, TOCNLNZ (or OCNLNZ) establishes indices for problem range, reads control parameters, and prints out all information concerning initialization, tape arrangement, and execution preparation. When finished, it calls for energy data and overall energy plottings. The normal end of a job should terminate at this point. Within the control and execution routine, MAINCL coordinates the preparation phase and the computation phase as well as controls

the sequence of computations. ACALK32 prepares for the calculation of advection terms when called by MAINCL and calls for CMPTA and NONLIN to do the calculations. CMPTA also computes the pressure gradient terms and the advection terms. NONLIN computes the horizontal nonlinear terms in the momentum equations. FCAL32 prepares all necessary steps for the calculation of friction terms. It is called by MAINCL and summons CMPTF to do the computations. CMPTF computes the friction terms and is called by FCALK32. ADVCO calculates the advanced time-step (n+1) values of variables u′, v′, S, T and is called from CNTX where $\psi$ is advanced. CALCAJ adjusts the density of the vertical water columns whenever unstable layers are detected. The vertically integrated terms are also calculated similtaneously in CMPTA and CMPTF and the stream function, $\psi$, is obtained after RELAX. RELAX solves the vorticity equation by using the relaxation method.

CNTX, mentioned above, is a routine for time-step advancing. It also computes the Coriolis terms and calls CALCAJ and ADVCO to calculate the necessary density adjustments and advance the computation. COLDST is a routine specifically designed to implement cold start runs. It zeros the velocity field and sets S and T uniformly. In the event of a restart run, this routine will not be engaged.

GRDCST builds the constant file and reads all necessary data from the card reader to generate the constant files which it then stores in a constant file for the computation phases.

WUVCAL computes vertical velocity using the continuity equation. WFLOUT checks and controls all binary output files and listing files.

In the TOCNLNZ program only, FRCST reads in Fourier coefficients for seasonal variations of boundary conditions from the card input and stores those data in the constant file. QTSTXY is a routine which computes the time-dependent $Q_t$, $T_x$, $T_y$ with data from FRCST which is in the constant file. The latter routine is also unique to TOCNLNZ. QTEMPF computes $Q_t$ from $Q_1$, $Q_2$, and $T_a$ and takes the mean of $Q_t$ and EMP.

The following routines are included within the classification of input/output data and file manipulation routines. BINCPMA is used to begin the computation of all advection terms, it will erase the previous locations, reinitial tapes and disks, etc. CALCKO lists out the stream function values and residue values when non-convergence occurs in the relaxation process. CHGTAPE changes to another tape when the preceding tape is full. CSTOUT computes time intervals to the equivalent number of time steps. CRDINP reads cards and checks the sequence for certain standard format inputs while FLYDST searches for specific days in any of the binary files and collects the necessary data for starting the integration.

FRPRT prints out all Fourier coefficients when required, GTABOUT prints out data in tabulated form, and INDTABL prints out all indices in tabulated form. INDINTG changes the indices of the fictitious boundaries from the specified negative value

to the real indices and vice versa. LSTCSTI lists out initial data in the group, LSTOUT lists $\psi$, u, v, w, S, and T values in group, PRTDJK lists cross-sectional data, PRTENGX prints out the five energetic values in time sequence and in tabulated form, and REQLCM requests large core memory.

The function of UNBLOCK is to unblock data stored in 3 separated blocks in order to form the original North Pacific grid. This process is taken before making plots for $\psi$, u, v, w, S and T. The function of GENPLOT is to plot $\psi$, u, v, w, S and T using data unblocked from program UNBLOCK. Five separate tapes storing complete data for the entire ocean are called for mounting. The plots are drawn automatically in DD80 microfilm. These programs will be provided upon request.

The buffers include RDBUF which buffers in data from regular input devices and RDBUFL which buffers in data from LCM. WTBUF buffers out routine to regular output devices (tapes, cards, etc.) and WTBUFL buffers out data to LCM. REWDTP rewinds the tapes, ZEROBF zeros out values of all variables from the called layer, DATPLT specifies the unit scale in drawing the grid lines in the output plotting and MPLOT sets up adjustable scales for multi-line plotting and plots.

## DICTIONARY OF MAJOR VARIABLES*

| | |
|---|---|
| DAYS, DAYT, DAYB, DAYSE, DAYFR | Model simulation days |
| KDAT, KDATT, KDATB, KDATSE, KDATFR | The date of the job run |
| DIFDAY | $\Delta t$ in days |
| DTIME | $\Delta t$ in seconds |
| DAYEND | Last day of job |
| MAXI | Maximum I of the entire domain |
| IMAX, IMX | Maximum I of a block |
| JMAX, JMX | Maximum J of a block |
| KMAX | Maximum K of the ocean |
| NCARD | Sequential number of input cards |
| KSYB | A three character alphabetic symbol to identify input data cards |
| ITIL(8) | 80 character title |
| NAMT(3,4) | 30 character name of four input/output binary files |
| NTAP(4) | Logical number for four input/output binary files |
| NRT(4) | Maximum group records can store in one tape of the four files |
| KNR(4) | Counter for number of records stored in one tape of each of the four files |
| MWT(4) | Number of time-steps elapsed for writing on tape for four files |
| LDW(4) | Counter for writing on tape for four files |
| LSTP(4) | Counter for listing of four files |

*No attempt has been made to list and define all variables used in this program and associated subprograms.

| | |
|---|---|
| BG(4) | The beginning days of each run for four files |
| DOUT(4) | Number of time-stpes for output of four files |
| NOTAP(4) | Number of tapes assigned to four files |
| ITAP(4) | The number of the first tape in the assigned sequence of the four files to be used at start of this run |
| MTLAB(10,4) | The labels of tapes assigned for the four files |
| PRTDAY | Time interval for a print-out in days |
| LDWP | Number of time-steps for one print output |
| IDMDA | Number of locations in CMN2 from beginning to IBI, except IBI |
| IDMDB | Number of locations in CMN2 from IBI to the end |
| IDMDC | Number of locations in CMN1 from PPT to the end |
| NDIM | Number of locations for (IMX × JMX) |
| IDMDD | Number of locations for (4 × NDIM) |
| NDIM1 | Number of locations for (NDIM + 3 identifiers) |
| NDIM2 | Number of locations for (5 × NDIM + 1 identifier) |
| NDSK1...NDSK8 | Logical units of rotary files for computations |
| MSUN | Counter for Mutsuno steps |
| MSUI | Time-steps for interval to apply the Mutsuno scheme |
| IBSCAN | Number of scans in a block during relaxation |
| MSCAN | Maximum number of scans in S.O.R. |
| EPSL | Criterion to control convergence in S.O.R. |

| | |
|---|---|
| ALPHAR | Over-relaxation factor |
| ALPHA1 | (1t + ALPHAR) |
| MSWP | Maximum times for density adjustments |
| MCOUNT | Maximum unsatisfied density points allowed |
| MSLCT(3) | Maximum selected points for each of three blocks |
| LGLTIJ(2,4,3) | The (I,J) values of selected points |
| IB, IBI, IBT, IBFR | Block numbers |
| PT(23,27) | $\frac{\partial\psi}{\partial t}$ |
| KB, KT | Layer index |
| UT, VT, ST, TT(23,27) | $\frac{\partial u}{\partial t}$ , etc. |
| PPT(23,27) | Temporary storage of $\frac{\partial\psi}{\partial t}$ |
| RES(23,27) | Residues for the stream function |
| UTM, VTM(23,27) | Vertically integrated values of $\frac{\partial V}{\partial t}$ |
| XUVR(2884) | Dimension for buffers of PPT, RES, UTM, VTM |
| BT(624) | Stores $\frac{\partial\psi}{\partial t}$ plus three identifiers |
| OT(3106) | Stores time rate of change of (u, v, w, S, T) plus layer identification |
| NIB | Maximum number of blocks |
| IUNDF | Undefined integer value (-99) |
| RUNDF | Undefined float point value (-0.0) |
| FLAT1 | Western latitude of the domain |
| FLAT2 | Eastern latitude of the domain |
| FLONG1 | Southern longitude of the domain |
| FLONG2 | Northern longitude of the domain |
| SO | Reference salinity (34.72‰) |
| TO | Reference temperature (5°C) |

| | |
|---|---|
| RØO | Reference density (1.0276 $\frac{gm}{cm^3}$) |
| ALPHA | Thermal expansion coefficient |
| B | Salinity coefficient |
| HEATC | Specific heat at constant pressure for ocean water |
| PI | $\pi$ |
| RE | Radius of earth |
| G | Gravity |
| VISY | Horizontal viscosity |
| SVISY | Horizontal diffusivity for salinity |
| TVISY | Horizontal diffusivity for temperature |
| VISZ | Vertical viscosity |
| SVISZ | Vertical diffusivity for salinity |
| TVISZ | Vertical diffusivity for temperature |
| PØWER | Exponential power for the horizontal viscosity (4/3) |
| TAREA, UAREA | Area of a block |
| TVØL | Total volume |
| TKK | $273.2^{\circ}$K |
| CSTQ | Equivalent constant of heat for adjusting unit to C.G.S. |
| CSTE | Equivalent constant of water for adjusting unit to C.G.S. |
| SECDAY | 86400 |
| DXT(27), DXU(27) | Unit horizontal separation distance in x-direction in C.G.S. |
| RDXU2(27) | 1/(2 × DXU(J)) |
| DYT, DYU | Unit horizontal separation in y-direction in C.G.S. |

| | |
|---|---|
| RDYU2(27) | $1/(2 \times \text{DYU})$ |
| EPSSK(10) | $\varepsilon_{s(k)}$ |
| EPSTK(10) | $\varepsilon_{t(k)}$ |
| ROCRIT(10) | $\varepsilon_{\rho(k)}$ |
| DZ(10) | $\Delta z_k$ |
| DZMH(10) | $\Delta z_{k+\frac{1}{2}}$ |
| Z(10) | Set in layer depth |
| DEPTH | Total depth |
| BETA(27) | $\partial f/\partial y$ |
| F(27) | Coriolis force |
| DG(27) | $G\Delta z_{k+\frac{1}{2}}$ |
| AYZT(10) | $\Delta y\ \Delta z_k$ |
| AUXY(27) | $\Delta x_{j+\frac{1}{2}}\Delta y$ |
| AXZT(27,10) | $\Delta x_j \Delta z_k$ |
| AXZU(27,10) | $\Delta x_{j+\frac{1}{2}}\Delta z_k$ |
| AX(27,10) | $\nu_1 \Delta y \Delta z_k$ |
| AY(27,10) | $\nu_1 \Delta x_j \Delta z_k$ |
| AZ(27,10) | $\nu_2 \Delta x_{j+\frac{1}{2}}\Delta y/\Delta z_{k+\frac{1}{2}}$ |
| CSX(27,10) | $\kappa_1 \Delta y \Delta z_k$ |
| CSY(27,10) | $\kappa_1 \Delta x_{j+\frac{1}{2}}\Delta z_k$ |
| CSZ(10) | $\kappa_2/\Delta z_{k+\frac{1}{2}}$ |
| CTX(27,10) | $\kappa_1 \Delta y \Delta z_k/\Delta x_j$ |
| CTY(27,10) | $\kappa_1 \Delta x_{j+\frac{1}{2}}\Delta z_k/\Delta y$ |
| CTZ(27,10) | $\kappa_2/\Delta z_{k+\frac{1}{2}}$ |
| VISX(27) | $\nu_1(\Delta x_{j+\frac{1}{2}}/\Delta x_o)^{4/3}$ |
| SVISX(27) | $\kappa_1(\Delta x_j/\Delta x_o)^{4/3}$ |
| TVISX(27) | $\kappa_1(\Delta x_j/\Delta x_o)^{4/3}$ |

| | |
|---|---|
| IMEF1 | Minimum I in the western boundary of the domain |
| IMEF2 | Maximum I in the western boundary of the domain |
| JMEF1 | Minimum J in the southern boundary of the domain |
| JMEF2 | Maximum J in the southern boundary of the domain |
| LAN(2) | The sequential number of the fictitious boundary of the block |
| ING(2) | The index of I for the fictitious left and right boundaries of the block |
| INDBL(27) | Indices of the left boundary of the block |
| INDBR(27) | Indices of the right boundary of the block |
| LSBY(23) | Alphabetic symbols of coordinate |
| IEF1(27) | The starting I of jth row of the computational domain |
| IEF2(27) | The ending I of the jth row of the computational domain |
| IND(23,27) | The index of every point |
| AREAT | Total surface area |
| AREAB | The block surface area |
| ATXY(23,27) | Surface area of every computational box with respect to the temperature point |
| X(2812) | Dimension of constants for the convenience of buffer |
| Y(2013) | Dimension of constants for the convenience of buffer |
| BP(624) | Stream function in a block plus three identifiers |
| OA, DB, OC(3106) | Variable values ($\Psi$, w, S, T) in a block and layer identifier |

| | |
|---|---|
| UA,VA,WA,SA,TA(23,27) | Variable values of the upper layer |
| UB,VB,WB,SB,TB(23,27) | Variable values of the middle layer |
| UC,VC,WC,SC,TC(23,27) | Variable values of the lower layer |
| LCMNAN(33,7) | Identifiers for the LCM requested |
| LCNT(7) | Counters for the LCM records in the 7 rotary files |
| NR1234, NR567 | Lengths of records in file 1234 and file 567 |
| ENGE(5) | Stores 5 energetic terms |
| PCH(4,3) | Stores stream function at selected points in block |
| UCH,VCH,WCH,SCH, TCH(4,10,3) | Stores variable values at selected points in three blocks |
| ITEM | Energetic term identifier |
| NWDS | Maximum locations provided for energy plot |
| LEL | Counter for NWDS has been stored |
| ENGL(6,100) | Maximum storage space for energy plot once |
| FAC(6) | Normalizing factor for energetic terms for plotting |
| IPL(6) | Controls the sequence to be plotted |
| IR | Controls the item to be listed in y-axis on plot |
| NPLX | Number of curves to be plotted on one chart |
| KTPR(8) | For TLIB specifications at NCAR |
| TAIR(23,27) | Stores air temperature |
| QT(23,27) | Stores total heat fluxes |
| STX(23,27) | Stores x-component of wind stresses |
| STY(23,27) | Stores y-component of wind stresses |
| ZDMQT | Number of locations for heat storage |

| | |
|---|---|
| IDMF2 | Number of locations for Fourier coefficients I |
| IDMF4 | Number of locations for Fourier coefficients II |
| LCMFR(65) | LCM identifier for Fourier coefficients |
| LCMFRØ | LCM identifier for zeroth order Fourier coefficients |
| NORDER | Order of Fourier coefficients |
| PERIOD | The period of imposed atmospheric boundary conditions |
| MAXFR | Maximum sets of Fourier coefficients |
| IOFR | Switch for control output of Fourier coefficients |
| START | The starting day of this run (-1.00 for coldstart) |
| LSTAR | Switch to control whether the starting file is to be listed (0=no, 1=yes) |
| DOUT(4) | Specify time intervals for output of 4 binary files |
| LDW(4) | Time-steps for outputs of 4 binary files |
| MWT(4) | Counters of time-steps for LDW(4) |

TABLE 1

DESCRIPTION OF SYMBOLS IN THE OCEAN MODEL

| | |
|---|---|
| $t$ | time |
| $\lambda$ | longitude |
| $\phi$ | latitude |
| $z$ | height |
| $\Omega$ | angular speed of the earth |
| $a$ | radius of the earth |
| $g$ | acceleration of gravity |
| $u$ | zonal component of the current |
| $v$ | meridional component of the current |
| $V$ | reference horizontal velocity |
| $w$ | vertical component of the current |
| $T$ | temperature |
| $S$ | salinity |
| $\rho$ | density |
| $F^{\lambda}$ | eastward frictional force per unit volume |
| $F^{\phi}$ | northward frictional force per unit volume |
| $\nabla$ | horizontal gradient operator |
| $h$ | step function incorporated with density stability |
| $G^{\lambda}$ | nonlinear component in the zonal direction |
| $G^{\phi}$ | nonlinear component in the meridional direction |
| $Q_S$ | downward heat flux |
| $Q_I$ | incoming solar radiation |
| $Q_B$ | back radiation |

TABLE 1 (Concluded)

| | |
|---|---|
| $Q_H$ | sensible heat |
| $Q_E$ | latent heat |
| $Q_o$ | incoming solar radiation with a clear sky |
| $N_c$ | cloudiness in tenths |
| $e_a$ | vapor pressure of air |
| $e_s$ | saturated vapor pressure |
| $T_s$ | ocean surface temperature |
| $T_a$ | air temperature |
| $c$ | Stefan-Boltzmann constant |
| $L$ | latent heat of evaporation |
| $\rho_a$ | air density |
| $V_a$ | wind velocity |
| $q$ | specific humidity |
| $P_a$ | air pressure |
| $C_D, C_E, C_H$ | drag coefficient for momentum, latent heat, and sensible heat, respectively |
| Ri | bulk Richardson number |
| $\tau^{\lambda}$ | longitudinal component of wind stress |
| $\tau^{\phi}$ | latitudinal component of wind stress |

TABLE 2

VALUES OF PARAMETERS AND CONSTANTS IN THE OCEAN MODEL

| Parameter of constant | Symbol | Value | Unit |
|---|---|---|---|
| reference temperature | To | 278.2 | °C |
| reference salinity | So | 34.72 | °/oo |
| reference density | $\rho_o$ | 1.0276 | gm/cm$^3$ |
| thermal expansion coefficient | $\alpha$ | $2.75 \times 10^{-4}$ | K°$^{-1}$ |
| saline contraction coefficient | $\gamma$ | $7.5 \times 10^{-4}$ | (parts/million)$^{-1}$ |
| longitudinal separation | $\Delta\lambda$ | 2.5 | degree |
| latitudinal separation | $\Delta\phi$ | 2.5 | degree |
| longitude at the western boundary | $\lambda_o$ | varies | °W |
| longitude at the eastern boundary | $\lambda_i$ | varies | °E |
| latitude of the northern boundary | $\phi_j$ | varies | °N |
| total depth | D | 4 | km |
| horizontal eddy viscosity | $\nu_1$ | $2.5 \times 10^8$ | cm$^2$/sec |
| horizontal eddy diffusivity | $\kappa_1$ | $10^7$ | cm$^2$/sec |

TABLE 2 (Continued)

| Parameter or constant | Symbol | Value | Unit |
|---|---|---|---|
| vertical eddy viscosity | $\nu_2$ | 1.5 | $cm^2/sec$ |
| vertical eddy diffusivity | $\kappa_2$ | 1 | $cm^2/sec$ |
| earth rotation rate | $\Omega$ | $7.27 \times 10^{-5}$ | $sec^{-1}$ |
| specific heat of sea water | $C_p$ | 0.958 | cal/gm K |
| time-step | $\Delta t$ | 4.2 | hours |
| Ekman number | E | $1.63 \times 10^{-6}$ | nondimensional |
| Rossby number | Ro | $2.03 \times 10^{-5}$ | nondimensional |
| Reynolds number | Re | 10 | nondimensional |
| Péclét number | Pé | 100 | nondimensional |
| lateral wdith of frictional boundary layer | $L_F$ | $1.2 \times 10^{-2}$ | nondimensional |
| lateral width of inertia boundary layer | $L_I$ | $4.5 \times 10^{-3}$ | nondimensional |
| drag coefficient under neutral state | $(C_D)_N$ | $2.5 \times 10^{-3}$ | ergs |
| constants in drag coefficients | $b_1$ | 52.9 | ergs |
| constants in drag coefficients | $b_2$ | 53.2 | ergs |

TABLE 2 (Concluded)

| Parameter or constant | Symbol | Value | Unit |
| --- | --- | --- | --- |
| constant in Richardson number | $\beta_V, \beta_T$ | 4.7 | |
| constant in Richardson number | $Z_{10}$ | $10^3$ | cm |
| constant in Richardson number | $T_{vo}$ | 290 | K |

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*No attempt has been made to list and define all variables used in this program and associated subprograms.



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APPENDICES

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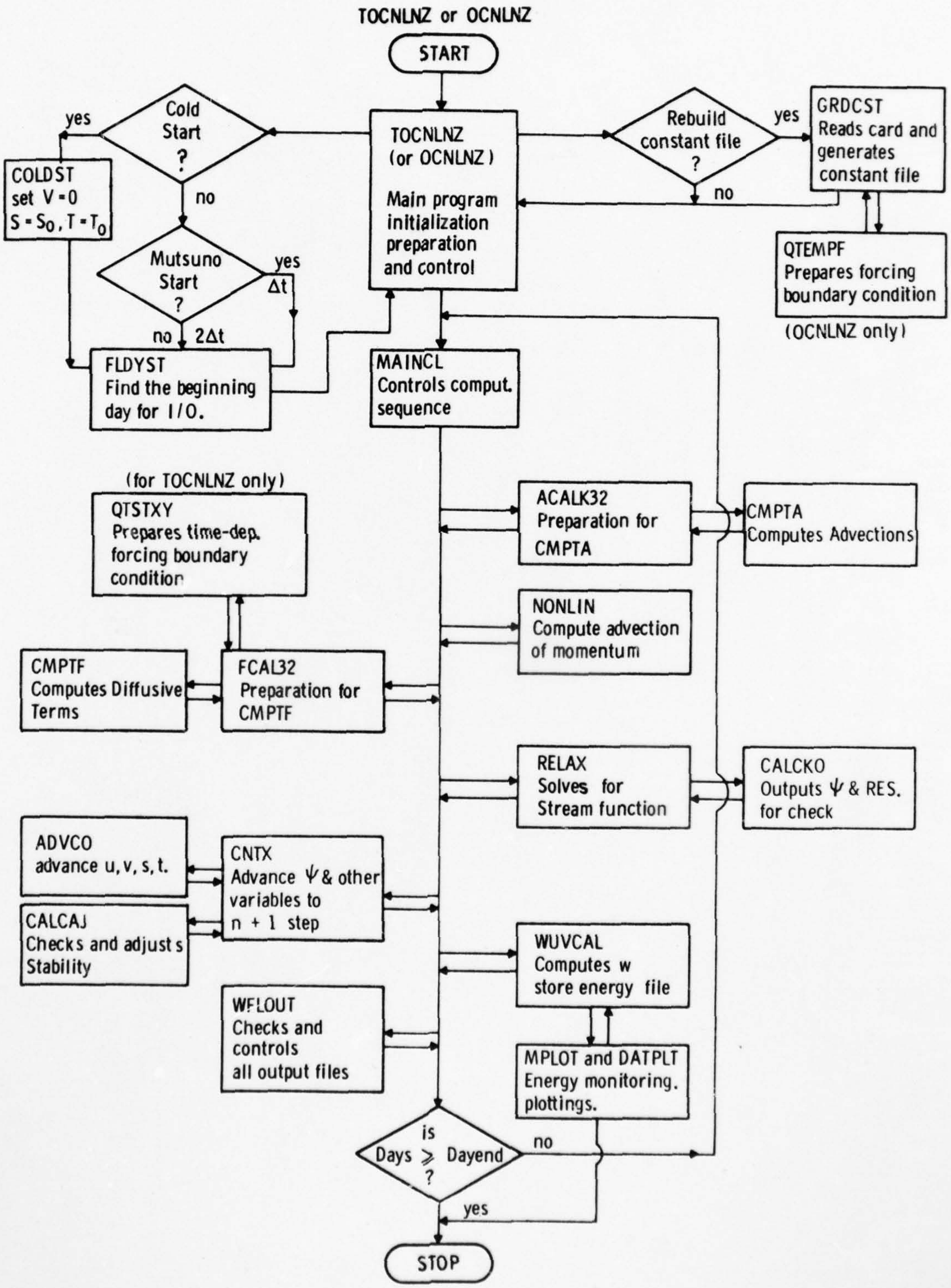
APPENDIX A

FLOW CHART OF THE OCEAN MODEL



APPENDIX B

FORTRAN PROGRAM LIST OF TOCENLNZ

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```
        *SEQUENCE,249154                    DATE  12/31/76        TIME  15/17/53
        *JOB,5066,35631002,HUANG,SHIEH
WARNING -  90 PERCENT OF CRUS ALLOCATED HAVE BEEN USED.
CRUS ALLOCATED =     178000.00
     CRUS USED =     170926.85
        *LIMIT,PT=5,PR=300
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*FORTRAN,S=PLIB,N=TOCNLNZ,FL
TOCNLNZ        VERSION    17          FILE GENERATED ON 08/ 4 AT  18. 3 HRS
CARD                 APPROXIMATE
NUMBER             PROGRAM LOCATION
      0         PROGRAM TOCNLNZ
      0    C  ************FOR TIME-DEPENDENT BOUNDARY CONDITION*****************
      0    C  ---- CALCULATE QT(I,J), STX(I,J) AND STY(I,J) FROM PERIODIC FOURIER
      0    C  ---- CONSTANTS.
      0    C  ========== BEGINING OF DIMENSION CHANGE  ==========              NEWP.4
      0          COMMON  BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
      0        1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
      0          COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,NEWP.5
      0        1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)NEWP.6
      0        2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)NEWP.7
      0        3,LSTP(4),PG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,   NEWP.8
      0        3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,NEWP.9
      0        3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANNEWP.10
      0        4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),NEWP.11
      0        4LGLTIJ(2,4,3),XXX(30)                                              NEWP.12
      0        4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23,  NEWP.13
      0        627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)         NEWP.14
      0          DIMENSION XJVR(2484)                                               NEWP.15
      0          EQUIVALENCE (PPT(1),XJVR(1))                                       NEWP.16
      0          DIMENSION BT(624),DT(3106),NAM1(3),NAM2(3),NAM3(3),NAM4(3)         NEWP.17
      0          EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                                NEWP.18
      0          EQUIVALENCE (NAMT(1),NAM1(1)),(NAMT(4),NAM2(1)),(NAMT(7),NAM3(1)),NEWP.19
      0        1(NAMT(10),NAM4(1))                                                  NEWP.20
      0          COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,     NEWP.21
      0        1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,     NEWP.22
      0        2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTO,CSTE,SECDAY,NEWP.23
      0        3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),KOCRITNEWP.24
      0        4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),   NEWP.25
      0        1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),   NEWP.26
      0        6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX(  NEWP.27
      0        727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   NEWP.28
      0        8LAN(2),INC(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND(  NEWP.29
      0        923,27),AREAT,AREAJ,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)NEWP.30
      0        1,EPD(23,27)
      0          DIMENSION X(2812),Y(2013)
      0          EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                 NEWP.33
      0          COMMON/CMN3/BP(624),DA(3106),DB(3106),DC(3106)                     NEWP.34
      0          DIMENSION P(23,27)                                                 NEWP.35
      0          DIMENSION JA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)        NEWP.36
      0          DIMENSION JB(23,27),VB(23,27),WB(23,27),SB(23,27),TB(23,27)        NEWP.37
      0          DIMENSION JC(23,27),VC(23,27),WC(23,27),SC(23,27),TC(23,27)        NEWP.38
      0          EQUIVALENCE (BP(1),DAYX),(BP(2),KDATX),(BP(3),IB),(BP(4),P(1))     NEWP.39
      0          EQUIVALENCE (DA(1),KA),(DA(2),UA(1)),(DA(623),VA(1)),(DA(1244),WA(NEWP.40
      0        11)),(DA(1865),SA(1)),(DA(2486),TA(1))                               NEWP.41
      0          EQUIVALENCE (DB(1),KB),(DB(2),UB(1)),(DB(623),VB(1)),(DB(1244),WB(NEWP.42
      0        11)),(DB(1865),SB(1)),(DB(2486),TB(1))                               NEWP.43
      0          EQUIVALENCE (DC(1),KC),(DC(2),UC(1)),(DC(623),VC(1)),(DC(1244),WC(NEWP.44
      0        11)),(DC(1865),SC(1)),(DC(2486),TC(1))                               NEWP.45
      0          COMMON/NLCM/LCMNAM(33,7),LCNT(7),NR1234,NR567                      NEWP.46
      0          COMMON/ENSL/DAYSE,KDATSE,ENGE(5),PCH(4,3),UCH(4,10,3),VCH(4,10,3),NEWP.49
      0        1WCH(4,10,3),SCH(4,10,3),TCH(4,10,3),ITEM,NWDS,LEL,ENGL(6,100)       NEWP.50
      0        1,FAC(6),IPL(6),IR,NPLX                                              NEWP.51
      0          DIMENSION KTPR(8)
```

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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
  54                 0              EQUIVALENCE (KDAT,FDAT)
  55                 0              DATA MXPTS,ITEM,NWDS,LEL,IR,NPLX/4,6,100,0,1,5/                         NEWP.52
  56                 0              DATA IPL/2,3,5,4,6,0/                                                   NEWP.53
  57                 0              DATA FAC/1.0,1.0E23,1.0E24,1.0E24,1.0E32,1.0E32/                        NEWP.54
  58                 0              DATA NDSK1,NDSK2,NDSK3,NDSK4,NDSK5,NDSK6,NDSK7/1,2,3,4,5,6,7/           NEWP.55
  59                 0              DATA MAXI,NIB,IMAX,JMAX,KMAX,SECDAY,PWGT/65,3,23,27,10,86400.0,4./NEWP.56
  60                 0              DATA NCARD1,NTP01,NTP02,MSUND/ 441,6,40,30/
  61                 0        C   ********** ENDING OF DIMENSION CHANGE **********
  62                 0              DATA NAM1/30H $$$  CONSTANT-DATA  FILE $$$ /
  63                 0              DATA NAM2/30H ***HISTORY-STARTING FILE *** /                             NEWP.60
  64                 0              DATA NAM3/30H === HISTORY-OUTPUT  FILE === /                             NEWP.61
  65                 0              DATA NAM4/30H ---  ENERGY-SELECT  FILE --- /                             NEWP.62
  66                 0              DATA (KTPR(I),I=1,7)/5H*TLIB,1H ,2HBN,4HBK=2,4HMS=1,2H  ,2H  /
  67                 0              DATA KTPR(8)/0/
  68                 0              FDAT=DATEF(1.0)
  69                15              ENCODE (10,1,KDAT) FDAT
  70                15        CBKY  CALL DATE (KDAT)                                                        NEWP.65
  71                25              NTPOT=NTP02
  72                25              NTAPF=NTAP(1)
  73                25              LF2=2                                                                   NEWP.67
  74                25              RUNDF=-0.0
  75                25              NCARD=0                                                                 NEWP.70
  76                25              NDIM=IMAX*JMAX $ NDIM1=NDIM+3 $ NDIM2=5*NDIM+1                          NEWP.71
  77                25              IDMDA=9*JMAX*KMAX+9*JMAX+10*KMAX+39                                     NEWP.72
  78                25              IDMDB=3*NDIM+IMAX+4*JMAX+19 $ IDMDC=4*NDIM
  79                25              IDMDD=(5*KMAX+1)*MXPTS*NIB+ITEM+1                                       NEWP.74
  80                25              NIBT=2*(NIB-1)                                                          NEWP.75
  81                25              KNR(1)=NIB+MAXI+2$KNR(2)=(KMAX+1)*NIB $KNR(3)=KNR(2) $KNR(4)=NIB+1
  82                25        C  **************SET LCM*************************                           NEWP.77
  83                25              NR1234=KNR(2) $ NR567=NIB                                               NEWP.78
  84                25              CALL        REQLCM (NIB,KMAX,NDIM1,NDIM2,IDMDB,IDMDC,MAXI)
  85               103              I1=J1=1 $ I2=IMAX $ J2=JMAX                                             NEWP.80
  86               103              READ 1, ITIL                                                            NEWP.81
  87               117          1   FORMAT (8A10)                                                           NEWP.82
  88               117              PRINT 8, ITIL, KDAT                                                     NEWP.83
  89               130          8   FORMAT (1H1,20X,8A10//10X,*DATE OF JOB RUN --*A10//                     NEWP.84
  90               130             135X,*==========INPUT DATA AND CALCULATED CONSTANTS==========*/)         NEWP.85
  91               130              PRINT 3, MAXI, NIB, IMAX, JMAX, KMAX                                    NEWP.86
  92               147          3   FORMAT (15X,*  MAXI, NIB, IMAX, JMAX, KMAX =*5I6/)                      NEWP.87
  93               147              PRINT 9,IDMDA,IDMDB,IDMDC,IDMDD, NDIM,NDIM1,NDIM2                       NEWP.88
  94               172          9   FORMAT (/15X,*IDMDA,IDMDB,IDMDC,IDMDD, NDIM,NDIM1,NDIM2=*7I8/)          NEWP.89
  95               172              READ 2, DAYEND,DIFDAY, START,LSTART,PRTDAY                              NEWP.90
  96               211          2   FORMAT (3F10.3,I2,F8.3)                                                 NEWP.91
  97               211              DTIME1=DIFDAY*SECDAY $ DTIME2=DTIME1+DTIME1                             NEWP.92
  98               211              CALL CSTOUT (DIFDAY,PRTDAY,LDWP)                                        NEWP.93
  99               221              LPSTP=0                                                                 NEWP.94
 100               221              PRINT 4,  DAYEND,DIFDAY,DTIME1,START,LSTART, PRTDAY,LDWP                NEWP.95
 101               245          4   FORMAT (15X,*ENDING DAYS = DAYEND =*F12.5 * (DAYS)*/                    NEWP.96
 102               245             115X,*TIME STEP IN  DAYS    = DIFDAY =*F12.5, * (DAYS)*/                 NEWP.97
 103               245             115X,*TIME STEP IN SECONDS = DTIME1 =*E16.8, *(SEC)*/                    NEWP.98
 104               245             315X,*CONTROL NO. OF STARTING-DAYS = START =*F12.5,* (DAYS)*/            NEWP.99
 105               245             415X,*      -----COLD START (DAYS=0.0), IF START .LT. 0.0 -----*/        NEWP.100
 106               245             115X,*CONTROL NO. WHETHER (RE-) START INPUT VALUE OF P,U,V,W,S,T TONEWP.101
 107               245             2 BE LISTED = LSTART =*I3/                                               NEWP.102
 108               245             515X,*NO. OF   ==DAYS==  PER PRINT-OUTPUT = PRTDAY =*F15.5,* (DAYS)*NEWP.103
 109               245             5/15X,*NO. OF TIME-STEPS PER PRINT-OUTPUT =  LDWP  =*I10/)               NEWP.104
```

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CARD          APPROXIMATE
NUMBER      PROGRAM LOCATION
 110              245              READ 54, MSUN,IBSCAN,MSCAN,ALPHAR,EPSL                              NEWP.105
 111              254          54  FORMAT (3I5, F10.4,E15.7)                                           NEWP.106
 112              265              IF (MSUN .NE. 0) GO TO 76                                           NEWP.107
 113              267              MSUN=MSUND                                                          NEWP.108
 114              267              PRINT 75, MSUND                                                     NEWP.109
 115              300          75  FORMAT (//10X,5H*****,* INPUT MSUN =0, DEFAULT VALUE TO BE USED,    NEWP.110
 116              300             1MSUN = MSUND =*I5/)                                                 NEWP.111
 117              300          76  CONTINUE                                                            NEWP.112
 118              300              ALPHA1=(1.0+ALPHAR)/PWGT                                            NEWP.113
 119              300              PRINT 55, MSUN,IBSCAN,MSCAN,ALPHAR,EPSL,PWGT                        NEWP.114
 120              324          55  FORMAT (15X,*NO. OF TIME-STEPS PER STABLIZING (MATSUNO) CALCULATIO
 121              324             1N = MSUN =*I5/20X,*---- MSUN = (POSITIVE, NEGATIVE) = (NORMAL STARNEWP.116
 122              324             2T, MATSUNO START) ----*//
 123              324             2               15X,*MAXIMUM NO. OF SCANNING (RELAXATION) PER BLOCKNEWP.118
 124              324             2 = IBSCAN =*I5/15X,*MAXIMUM NO. OF BLOCK SCANNING = MSCAN =*I5/     NEWP.119
 125              324             2     15X,*SCANNING AJUSTABLE PARAMETER = ALPHAR =*F10.4/            NEWP.120
 126              324             315X,*MAXIMUM ERROR ALLOWED IN RELAXATION = EPSL =*E16.8/            NEWP.121
 127              324             415X,*WEIGHT FACTOR = PWGT =*F10.4/)                                 NEWP.122
 128              324              READ 56, MSWP,MCOUNT, IOFR
 129              337          56  FORMAT (3I5)
 130              337              PRINT 57, MSWP,MCOUNT, IOFR
 131              352          57  FORMAT (15X,*DENSITY ADJUST PARAMETER, MSWP = MAXIMUM NO. OF ADJUSNEWP.126
 132              352             1T PER POINT =*I5/15X,*DENSITY ADJUST PARAMETER, MCOUNT = MAXIMUM NNEWP.127
 133              352             20. OF UNSTABLE POINTS PER BLOCK ALLOWED =*I5//
 134              352             315X,*========WHETHER FOURIER CONSTANTS TO BE LISTED, IOFR =*I4/)
 135              352              DO 15 I=1,4                                                         NEWP.129
 136              352              READ 5, NTAP(I),NOTAP(I),NRT(I),ITAP(I),BG(I),DOUT(I)               NEWP.130
 137              402           5  FORMAT (I2,I3,I5,I3,1X,2F13.4)                                      NEWP.131
 138              402              PRINT 6, (NAMT(J,I),J=1,3),I,NTAP(I),I,NOTAP(I),I,NRT(I),I,ITAP(I)NEWP.132
 139              402             1,I,KNR(I),I,BG(I)                                                   NEWP.133
 140              455           6  FORMAT (/10X,*CONTROL DATA FOR TAPE OF *3A10//                      NEWP.134
 141              455             115X,*TAPE LOGICAL UNIT = NTAP(*I1,3H) =,I2/                         NEWP.135
 142              455             315X,*NO. OF TAPES ASSIGNED TO THIS FILE = NOTAP(*I1,3H) =,I3/15X,   NEWP.136
 143              455             2 *MAXIMUM NO. OF USER#S GROUP-RECORD PER TAPE = NRT(*I1,3H) =,I5/   NEWP.137
 144              455             415X,*SEQUENCE NO. OF THE TAPE FOR STARTING = ITAP(*,I1,3H) =,I2/    NEWP.138
 145              455             415X,*NO. OF LOGICAL RECORDS PER USER#S GROUP-RECORD = KNR(*I1,3H)   NEWP.139
 146              455             4=,I4/15X,*BEGINING-CONTROL NO. IN DAYS = BG(*I1,3H) =,F15.5)        NEWP.140
 147              460              IF (NOTAP(I) .LE. 0) GO TO 13                                       NEWP.141
 148              462              NOMT=NOTAP(I)                                                       NEWP.142
 149              462              READ 12, (MTLAB(J,I),J=1,NOMT)                                      NEWP.143
 150              503          12  FORMAT (10A8)                                                       NEWP.144
 151              503              PRINT 16, (J,MTLAB(J,I),J=1,NOMT)                                   NEWP.145
 152              523          16  FORMAT (/15X,*LABEL OF MAGNETIC TAPE(S) ASSIGNED TO THIS FILE ARE*NEWP.146
 153              523             1/(20X,5(4X,I3,2H) ,A8)))                                            NEWP.147
 154              524          13  IF (I .NE. 1) GO TO 7                                               NEWP.148
 155              526              LSTDA=INT(DOUT(1))                                                  NEWP.149
 156              531              IF (LSTDA .LT. 0) LSTDA=-LSTDA                                      NEWP.150
 157              532              PRINT 17, DOUT(1), LSTDA                                            NEWP.151
 158              543          17  FORMAT (/15X,*CONTROL NO. WHETHER CONSTANTS-FILE TO BE LISTED = DONEWP.152
 159              543             1UT(1) =*F14.5/15X,*----CARD-INPUT NEEDED IF DOUT(1) .LT. 0.0----*/NEWP.153
 160              543             215X,*WHICH PART NEEDED TO BE LISTED = LSTDA =*I4/)                  NEWP.154
 161              543              GO TO 15                                                            NEWP.155
 162              543           7  CALL CSTOUT (DIFDAY,DOUT(I),LDW(I))                                 NEWP.156
 163              554              PRINT 14, I,DOUT(I),I,LDW(I)                                        NEWP.157
 164              573          14  FORMAT(/15X,*NO. OF DAYS PER OUTPUT (TO TAPE)  = DOUT(*I1,3H) =,    NEWP.158
 165              573             1F15.5/15X,*NO. OF TIME-STEPS OUTPUT TO TAPE = LDW(*I1,3H) =,I4/)    NEWP.159
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CARD              APPROXIMATE
NUMBER         PROGRAM LOCATION
 166                573      15  CONTINUE                                                         NEWP.160
 167                575          DO 62 IB=1,NIB                                                   NEWP.161
 168                575          READ 58, MSLCT(IB)                                               NEWP.162
 169                607      58  FORMAT (I4)                                                      NEWP.163
 170                607          PRINT 59, IB,IB,MSLCT(IB)                                        NEWP.164
 171                623      59  FORMAT (/10X,*FOR BLOCK*I3,*, NO. OF (I,J) POINTS TO BE SELECTED =NEWP.165
 172                623         1 MSLCT(*I2,2H)=,I4/)                                             NEWP.166
 173                626          IF (MSLCT(IB) .LE. 0) GO TO 62                                   NEWP.167
 174                630          MSLCTX=MSLCT(IB)                                                 NEWP.168
 175                630          READ 60, ((LGLTIJ(L,I,IB),L=1,2),I=1,MSLCTX)                     NEWP.169
 176                655      60  FORMAT ((10(2X,2I3)))                                            NEWP.170
 177                655          PRINT 61,  (I,(LGLTIJ(L,I,IB),L=1,2),I=1,MSLCTX)                 NEWP.171
 178                701      61  FORMAT ((5X,10(I4,2H (,I2,1H,,I2,1H))))                          NEWP.172
 179                701      62  CONTINUE                                                         NEWP.173
 180                703          DAYS=START                                                       NEWP.174
 181                707          IF (START .LT. 0.0) DAYS=0.0                                     NEWP.175
 182                711          L=1
 183                712          DO 18 J=1,3                                                      NEWP.177
 184                712      18  NAMX(J)=NAMT(J,L)                                                NEWP.178
 185                721          NTAPF=NTAP(1)
 186                721          ITS=ITAP(L) $ LABEL=MTLAB(ITS,L)                                 NEWP.179
 187                721          KTPR(6)=2HRT
 188                721          SWFR=DOUT(1)
 189                735          IF (DOUT(1) .GE. 0.0) GO TO 810
 190                736          KTPR(7)=2HOT
 191                742          IF (BG(1) .LT. 0.0) KTPR(6)=2HNS
 192                744          GO TO 811
 193                744     810  KTPR(7)=0
 194                745     811  CONTINUE
 195                746          CALL FLDYST (KDAT,NAMX,NTAP(L),ITAP(L),LABEL,KNR(L),BG(L),DAYX,   NEWP.180
 196                746         1ISTOP,MWT(L),KTPR)
 197                773          IF (DOUT(1) .GE. 0.0) GO TO 26                                   NEWP.183
 198                775          CALL GROCST                                                      NEWP.184
 199                776          MWT(1)=MWT(1)+1                                                  NEWP.185
 200                776          CALL WTBUF (NTAP(1),IDMDA,X)                                     NEWP.186
 201               1004          CALL REWDTP (NDSK5)                                              NEWP.187
 202               1007      24  CALL RDBUFL(NDSK5,IDMDB,Y)                                       NEWP.188
 203               1014          CALL WTBUF  (NTAP(1),IDMDB,Y)                                    NEWP.189
 204               1023          IF (IBI .LT. NIB) GO TO 24                                       NEWP.190
 205               1025          CALL FRCST (NTAPF, SWFR,IDFR)
 206               1032          NAMX(1)=NAMT(1,L) $ NAMX(2)=NAMT(2,L) $ NAMX(3)=NAMT(3,L)         NEWP.191
 207               1032          PRINT 25, MWT(L),DAYB, NAMX, NTAP(L), LABEL                      NEWP.192
 208               1061      25  FORMAT(/ 5X,*=====*I5,*-TH GROUP-RECORD (DAYB=*F14.5,*) OF *      NEWP.193
 209               1061         13A10,* HAS BEEN WRITTEN ON TAPE*I2,4H == ,A8/)                   NEWP.194
 210               1061          GO TO 850
 211               1061      26  MWT(L)=MWT(L)+1                                                  NEWP.197
 212               1062          IB=0                                                             NEWP.198
 213               1065          CALL RDBUF (NTAP(1),IDMDA,X)                                     NEWP.199
 214               1072          PRINT 29, MWT(1),DAYB,NTAP(1)                                    NEWP.200
 215               1105      29  FORMAT (/10X,*THE *I5,*-TH GROUP-RECORD OF DAYB=*F14.5,* (OF TAPE*NEWP.201
 216               1105         1,I2*) TO BE USED AS CONSTANT DATA INPUT.*/)                      NEWP.202
 217               1105          CALL LSTCSTI (IB)                                                NEWP.203
 218               1110      28  IB=IB+1                                                          NEWP.204
 219               1111          CALL RDBUF (NTAP(1),IDMDB,Y)                                     NEWP.205
 220               1116          CALL WTBUFL(NDSK5,IDMDB,Y)                                       NEWP.206
 221               1123          CALL LSTCSTI (IB)                                                NEWP.207
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   APPROXIMATE
PROGRAM LOCATION
      1127             IF (IB .NE. NIB) GO TO 28                                     NEWP.208
      1131             CALL FRCST (NTAPF, SWFR,IDFR)
      1131        C    ***** RETURN TAPE NTAP(1) CONSTANT-TAPE.                      NEWP.209
      1135         850 CALL CHGTAPE(L,2)
      1142             L=2
      1143             DO 852 J=1,3
      1143         852 NAMX(J)=NAMT(J,L)
      1155             ITS=ITAP(L) $ LABEL=MTLAB(ITS,L) $ KTPR(6)=2HRT $ KTPR(7)=2HDT
      1170             IF (BG(2) .LT. 0.0 .AND. DAYS .EQ. 0.0) KTPR(6)=2HNS
      1173             CALL FLDYST (KDAT,NAMX,NTAP(L),ITAP(L),LABEL,KNR(L),BG(L),DAYX,
      1173            1ISTOP,MWT(L),KTPR)
      1220          19 IF (START .GE. 0.0) GO TO 37                                  NEWP.212
      1222             MWT(L)=MWT(L)+1                                               NEWP.213
      1222             CALL COLDST (NDSK1,NDSK6)                                     NEWP.214
      1231             PRINT 25, MWT(L),DAYX, NAM2, NTAP(L), LABEL                   NEWP.215
      1252             CALL REWDTP (NDSK1)                                           NEWP.216
      1255             CALL REWDTP (NDSK2)                                           NEWP.217
      1261             IF (LSTART .NE. 0) CALL REWDTP (NDSK5)                        NEWP.218
      1265             MWT(L)=MWT(L)+1                                               NEWP.219
      1265             NAMX(2)=10H (INPUT FO $ NAMX(3)=10HR START)    $ LFE=1        NEWP.220
      1265          52 CALL RDBUFL (NDSK1,NDIM1,BP)                                  NEWP.221
      1301             LFE=1 $ LF2=2 $ NAMX(1)=10H P(I,J)
      1305             IF (LSTART .NE. 0) CALL RDBUFL (NDSK5,IDMOB,Y)                NEWP.222
      1313             CALL WTBUFL (NDSK2,NDIM1,BP)                                  NEWP.223
      1320             CALL WTBUF (NTAP(L),NDIM1,BP)                                 NEWP.224
      1330             IF (LSTART .NE. 0) CALL GTABOUT (NAMX,NTPOT,KDAT,IMAX,JMAX,DAYX,  NEWP.225
      1330            1IB,0,LF2,LSBY,P)                                              NEWP.226
      1346          35 CALL RDBUFL (NDSK1,NDIM2,DA)                                  NEWP.227
      1353             CALL WTBUFL (NDSK2,NDIM2,DA)                                  NEWP.228
      1360             CALL WTBUF (NTAP(L),NDIM2,DA)                                 NEWP.229
      1370             IF (LSTART .NE. 0) CALL LSTOUT (NAMX,NTPOT,KDAT,IMAX,JMAX,LSBY,LFENEWP.230
      1370            1,DAYX,IB,KA,UA,VA,WA,SA,TA)                                   NEWP.231
      1413             IF (KA .NE. KMAX) GO TO 36                                    NEWP.232
      1416             IF (IB .NE. NIB) GO TO 52                                     NEWP.233
      1420             PRINT 25, MWT(L),DAYX, NAM2, NTAP(L), LABEL                   NEWP.234
      1441             GO TO 43                                                      NEWP.235
      1441          37 CONTINUE                                                      NEWP.236
      1442             NDSKX=NDSK1                                                   NEWP.237
      1442             NAMX(2)=10H(INPUT FOR $ NAMX(3)=10H RE-START) $ LFE=1         NEWP.238
      1442          39 MWT(L)=MWT(L)+1                                               NEWP.239
      1447             CALL REWDTP(NDSKX)                                            NEWP.240
      1456             IF (LSTART .NE. 0) CALL REWDTP (NDSK5)                        NEWP.241
      1462          53 CALL RDBUF (NTAP(L),NDIM1,BP)                                 NEWP.242
      1471             LFE=1 $ LF2=2 $ NAMX(1)=10H P(I,J)
      1475             IF (LSTART .NE. 0) CALL RDBUFL (NDSK5,IDMOB,Y)                NEWP.243
      1503             KDATX=KDAT
      1503             CALL WTBUFL (NDSKX,NDIM1,BP)                                  NEWP.244
      1512             IF (LSTART .NE. 0) CALL GTABOUT (NAMX,NTPOT,KDAT,IMAX,JMAX,DAYX,  NEWP.245
      1512            1IB,0,LF2,LSBY,P)                                              NEWP.246
      1530          40 CALL RDBUF (NTAP(L),NDIM2,DA)                                 NEWP.247
      1537             CALL WTBUFL (NDSKX,NDIM2,DA)                                  NEWP.248
      1545             IF (LSTART .NE. 0) CALL LSTOUT (NAMX,NTPOT,KDAT,IMAX,JMAX,LSBY,LFENEWP.249
      1545            1,DAYX,IB,KA,UA,VA,WA,SA,TA)                                   NEWP.250
      1570             IF (KA .NE. KMAX) GO TO 40                                    NEWP.251
      1573             IF (IB .NE. NIB) GO TO 53                                     NEWP.252
      1576             IF (NDSKX .EQ. NDSK2) GO TO 41                                NEWP.253
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
                 1600          DAYK1=DAYX $ NDSKX=NDSK2                                     NEWP.254
                 1600          GO TO 39                                                     NEWP.255
                 1607      41  IF (ABS(DAYX-DAYS) .LT. 1.0E-8) GO TO 45
                 1611          PRINT 44, DAYS, DAYX                                         NEWP.257
                 1622      44  FORMAT (/10X,5H*****,* INCONSISTENT STARTING DAYS, DAYS ASSIGNED =NEWP.258
                 1622         1*,F14.4,*,  DAYS OF STARTING-FILE USED =*,F14.4/             NEWP.259
                 1622         225X,*-----JOB TERMINATES ABNORMALLY-----*/)                  NEWP.260
                 1622          CALL EXIT                                                    NEWP.261
                 1623      45  DIFD=DAYX-DAYX1                                              NEWP.262
                 1623          PRINT 81,DAYX1,DAYX,DIFD,DAYX,DIFDAY                         NEWP.263
                 1644      81  FORMAT (//15X,*RE-START INPUT BLOCKED DATA OF (P,U,V,W,S,T) BELONGNEWP.264
                 1644         1 TO*,F14.4,* DAYS, AND*,F14.4,* DAYS*/                       NEWP.265
                 1644         215X,*TIME-STEP BETWEEN THE INPUT DATA =*F14.4,* DAYS*//      NEWP.266
                 1644         315X, *------ FOR MONSUND-RESTART (MSUN .LT. 0), ONLY THE DATA OF*,NEWP.267
                 1644         4F14.4,* DAYS IS USED AS INITIAL VALUE -----*/                NEWP.268
                 1644         515X,* AND  TIME-STEP = DIFDAY =*,F14.4,* DAYS*/)             NEWP.269
                 1645          IF (MSUN .LT. 0) GO TO 63                                    NEWP.270
                 1652          IF (DIFD .EQ. 0.0 .AND. DAYX .EQ. 0.0) GO TO 63              NEWP.271
                 1660          IF (ABS(DIFD-DIFDAY) .LT. 1.0E-8) GO TO 63
                 1662          PRINT 42, NTAP(L),DAYX,DAYX1,DIFD,DIFDAY                     NEWP.273
                 1702      42  FORMAT (/10X,*-----TIME-STEP CALCULATED FROM INPUT TAPE*I2,3H IS, NEWP.274
                 1702         1F15.5,1H-,F15.5,2H =,F15.5,* (DAYS) */20X,*WHICH IS DIFERENT FROM NEWP.275
                 1702         1*F15.5*, THE ASSIGNED VALUE.*/20X,*-----JOB TERMINATES ABNORALLY*)NEWP.276
                 1702          CALL EXIT                                                    NEWP.277
                 1702    C     -------CALCULATION OF INITIAL VALUE OF PPT AND WRITE ON DISK NDSK6NEWP.278
                 1703      63  K=0 $ LF2=2
                 1703          CALL REWDTP (NDSK5)                                          NEWP.280
                 1715          CALL REWDTP (NDSK1) $ CALL REWDTP (NDSK2) $ CALL REWDTP(NDSK6) NEWP.281
                 1721      64  CALL RDBUFL (NDSK5,IDMDB,Y)                                  NEWP.282
                 1725          CALL RDBUFL (NDSK1,NDIM1,BP)                                 NEWP.283
                 1733          CALL RDBUFL (NDSK2,NDIM1,BT)                                 NEWP.284
                 1740          LR=1                                                         NEWP.285
                 1740          CALL INDINTG (IMAX,JMAX,IND,INDFL,LR,ING)                    NEWP.286
                 1751          LR=2                                                         NEWP.287
                 1751          CALL INDINTG (IMAX,JMAX,IND,INDBR,LR,ING)                    NEWP.288
                 1751    C  -----CALCULATION OF INITIAL PPT FOR RESTART---------            NEWP.289
                 1752          DO 58 J=1,JMAX                                               NEWP.290
                 1752          DO 58 I=1,IMAX                                               NEWP.291
                 1763          IF (IND(I,J)) 65,67,66                                       NEWP.292
                 1763      65  PPT(I,J)=RUNDF                                               NEWP.293
                 1763          GO TO 68                                                     NEWP.294
                 1763      66  PPT(I,J)=0.0                                                 NEWP.295
                 1763          GO TO 68                                                     NEWP.296
                 1763      67  PPT(I,J)=(PT(I,J)-P(I,J))/DTIME1                             NEWP.297
                 1763      68  CONTINUE                                                     NEWP.298
                 2005          CALL WTBUFL (NDSK6,IDMDC,XUVR)                               NEWP.299
                 2013          NAMX(1)=10H PPT(I,J)
                 2015          IF (LSTART .NE. 0) CALL GTABOUT (NAMX,NTPOT,KDAT,IMAX,JMAX,DAYX,  NEWP.301
                 2015         1IB,K,LF2,LSBY,PPT)                                           NEWP.302
                 2034          IF (IBT .EQ. NIB) GO TO 43                                   NEWP.303
                 2036      69  CALL RDBUFL (NDSK1,NDIM2,DT)                                 NEWP.304
                 2043          CALL RDBUFL (NDSK2,NDIM2,DT)                                 NEWP.305
                 2051          IF (KT .NE. KMAX) GO TO 69                                   NEWP.306
                 2053          GO TO 64                                                     NEWP.307
                 2053      43  CALL CHGTAPE(L,1)                                            NEWP.308
                 2060          KTPR(7)=2HDT
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APPROXIMATE
PROGRAM LOCATION
   2060          DO 35 L=3,4                                                   NEWP.310
   2060          DO 32 J=1,3                                                   NEWP.311
   2062     32   NAMX(J)=NAMT(J,L)                                             NEWP.312
   2072          ITS=ITAP(L)                                                   NEWP.313
   2075          LABEL=ATLAB(ITS,L)                                            NEWP.314
   2075          KTPR(5)=2HRT
   2106          IF (BG(L) .LT. 0.0) KTPR(6)=2HNS
   2110          CALL FLOYST (KDAT,NAMX,NTAP(L),ITAP(L),LABEL,KNR(L),BG(L),DAYX,  NEWP.315
   2110         1ISTOP,MWT(L),KTPR)
   2133          STOL =DAYS+DIFDAY*FLOAT(LDW(L))                               NEWP.317
   2141          IF (BG(L) .GE. 0.0) GO TO 38                                  NEWP.318
   2143          BG(L)=DAYS                                                    NEWP.319
   2143          GO TO 34                                                      NEWP.320
   2151     38   IF (STOL .GT. BG(L)) GO TO 34                                 NEWP.321
   2153          PRINT 33, NTAP(L),NAMX,STOL,BG(L)                             NEWP.322
   2172     33   FORMAT (//10X,*---1ST RECORD TO BE WRITTEN ON TAPE*I2,1X,3A10,   NEWP.323
   2172         14H IS ,F15.5/10X,* WHICH IS .LE. * F15.5,*, THE PREVIOUS RECORD*/ NEWP.324
   2172         325X,*-----JOB TERMINATES ABNORMALLY-----*//)                  NEWP.325
   2172          CALL EXIT                                                     NEWP.326
   2173     34   CALL CHGTAPE (L,1)                                            NEWP.327
   2177     35   CONTINUE                                                      NEWP.328
   2177     C                                                                  NEWP.329
   2201          CALL DATPLT (ITEM)                                            NEWP.330
   2205          LDW(1)=LOW2 $ LDW(2)=LDW(2)-1                                 NEWP.331
   2205          NAMT(1,1)=10HPRINT OUTP $ NAMT(2,1)=10HUT DATA OF $ NAMT(3,1)=1H  NEWP.332
   2205          MSUI=0                                                        NEWP.333
   2220          IF (MSUN .GT. 0) GO TO 72                                     NEWP.334
   2220     C  ********* MONSUNO START *********                               NEWP.335
   2221          MSUN=-MSUN                                                    NEWP.336
   2221          MSUI=MSUN-1                                                   NEWP.337
   2221     72   CONTINUE                                                      NEWP.338
   2224          DO 73 I=1,4                                                   NEWP.339
   2224     73   LSTP(I)=0                                                     NEWP.340
   2224     C  -------MAIN CALCULATION LOOP-------                             NEWP.341
   2231          J1=1 $ J2=JMAX                                                NEWP.342
   2231          DAYS1=DAYS $ OTIME=OTIME2 $ DAYS=DAYS+DIFDAY                  NEWP.343
   2244     70   IF (DAYS .GT. DAYEND) GO TO 101                               NEWP.344
   2245    111   CALL MAINCL (NDSK1,NDSK2,NDSK3,NDSK4,NDSK6,NDSK7)             NEWP.345
   2260          IF (DAYS .GT. DAYEND) GO TO 102                               NEWP.346
   2260     C ******* FOR NDSK1,2,3,4 ARE ALL OR SOME ARE DISKS********************NEWP.347
   2260     C112 CALL MAINCL (NDSK2,NDSK3,NDSK4,NDSK1,NDSK6,NDSK7)             NEWP.348
   2260     C    IF (DAYS .GT. DAYEND) GO TO 103                               NEWP.349
   2260     C113 CALL MAINCL (NDSK3,NDSK4,NDSK1,NDSK2,NDSK6,NDSK7)             NEWP.350
   2260     C    IF (DAYS .GT. DAYEND) GO TO 104                               NEWP.351
   2260     C114 CALL MAINCL (NDSK4,NDSK1,NDSK2,NDSK3,NDSK6,NDSK7)             NEWP.352
   2260     C    GO TO 70                                                      NEWP.353
   2260     C101 ASSIGN 111 TO LSWCH                                           NEWP.354
   2260     C    GO TO 105                                                     NEWP.355
   2260     C102 ASSIGN 112 TO LSWCH                                           NEWP.356
   2260     C    GO TO 105                                                     NEWP.357
   2260     C103 ASSIGN 113 TO LSWCH                                           NEWP.358
   2260     C    GO TO 105                                                     NEWP.359
   2260     C104 ASSIGN 114 TO LSWCH                                           NEWP.360
   2260     C105 IF (LSTP(2)) 107,108,106                                      NEWP.361
   2260     C106 LSTP(2)=-2                                                    NEWP.362
   2260     C107 GO TO LSWCH, (111,112,113,114)                                NEWP.363
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CARD           APPROXIMATE
NUMBER        PROGRAM LOCATION
 390               2260     C ******* FOR NDSK1,2,3,4 ARE ALL OR SOME ARE DISKS*****END**************NEWP.364
 391               2260     C ******* FOR NDSK1,2,3,4,6,7 ARE LCM *********************************  NEWP.365
 392               2261      112  CALL MAINCL (NDSK2,NDSK3,NDSK1,NDSK4,NDSK6,NDSK7)                   NEWP.366
 393               2274           IF (DAYS .GT. DAYEND) GO TO 103                                    NEWP.367
 394               2275      113  CALL MAINCL (NDSK3,NDSK1,NDSK2,NDSK4,NDSK6,NDSK7)                   NEWP.368
 395               2305           GO TO 70                                                           NEWP.369
 396               2305      101  ASSIGN 111 TO LSWCH                                                NEWP.370
 397               2306           GO TO 105                                                          NEWP.371
 398               2307      102  ASSIGN 112 TO LSWCH                                                NEWP.372
 399               2310           GO TO 105                                                          NEWP.373
 400               2311      103  ASSIGN 113 TO LSWCH                                                NEWP.374
 401               2312      105  IF (LSTP(2)) 107,108,106                                           NEWP.375
 402               2314      106  LSTP(2)=-2                                                         NEWP.376
 403               2315      107  GO TO LSWCH, (111,112,113)                                         NEWP.377
 404               2315     C  ***********FOR NDSK1,2,3,4 ARE ALL DISKS*********END**************   NEWP.378
 405               2322      108  IF (LEL .EQ. 0) GO TO 110                                          NEWP.379
 406               2324           CALL PRTENGX (NTPO1,KDAT,ITEM,NWDS,LEL,ENGL)                       NEWP.380
 407               2334           XMIN=2.0 $ XMAX=1.0 $ KF=1                                         NEWP.381
 408               2334           CALL MPLOT (NTPO1,KDAT,ITEM,NWDS,LEL,ENGL,XMIN,XMAX,IR,NPLX,IPL,   NEWP.382
 409               2334          1FAC,KF)                                                            NEWP.383
 410               2356           XMIN=-1.0 $ XMAX=-2.0 $ KF=0                                       NEWP.384
 411               2356           CALL MPLOT (NTPO1,KDAT,ITEM,NWDS,LEL,ENGL,XMIN,XMAX,IR,NPLX,IPL,   NEWP.385
 412               2356          1FAC,KF)                                                            NEWP.386
 413               2400      110  CONTINUE                                                           NEWP.387
 414               2400           DO 118 L=2,4                                                       NEWP.388
 415               2400           IF (MWT(L) .EQ. 0) GO TO 118                                       NEWP.389
 416               2400           CALL CHGTAPE (L,2)                                                 NEWP.390
 417               2411      118  CONTINUE                                                           NEWP.391
 418               2411     C  ******** NORMAL END OF JOB **********                                 NEWP.392
 419               2413           PRINT 120                                                          NEWP.393
 420               2421      120  FORMAT (///30X, 37H**********NORMAL END OF JOB**********//)        NEWP.394
 421               2421           END                                                                NEWP.395

       LENGTH OF ROUTINE    TOCNLNZ       3344

       VARIABLE ASSIGNMENTS
XUVR   -  10015C 1  BT     -    574C 1  DT     -   1754C 1  NAM1   -     46C 1  NAM2   -     51C 1  NAM3   -     54C 1
NAM4   -     57C 1  X      -      0C 2  Y      -   5374C 2  P      -      3C 3  UA     -   1161C 3  VA     -   2336C 3
WA     -   3513C 3  SA     -   4570C 3  TA     -   6045C 3  UB     -   7223C 3  VB     -  10400C 3  WB     -  11555C 3
SB     -  12732C 3  TB     -  14107C 3  UC     -  15265C 3  VC     -  16442C 3  WC     -  17617C 3  SC     -  20774C 3
TC     -  22151C 3  KTPR   -      0     BPT    -      0C 0  BUT    -    154C 0  BVT    -   2244C 0  BST    -   4334C 0
BTT    -   6424C 0  BUTM   -  10514C 0  BVTM   -  10670C 0  BPTEP  -  11044C 0  DAYS   -      0C 1  KDAT   -      1C 1
DIFDAY -      2C 1  DTIME  -      3C 1  DAYEND -      4C 1  MAXI   -      5C 1  IMAX   -      6C 1  JMAX   -      7C 1
KMAX   -     10C 1  IM1    -     11C 1  JM1    -     12C 1  IP1    -     13C 1  JP1    -     14C 1  I1     -     15C 1
J1     -     16C 1  I2     -     17C 1  J2     -     20C 1  I      -     21C 1  J      -     22C 1  K      -     23C 1
NCARD1 -     24C 1  NCARD  -     25C 1  KSYB   -     26C 1  INKD   -     27C 1  INDEX  -     30C 1  ITIL   -     31C 1
NAMX   -     41C 1  NTPO1  -     44C 1  NTPO2  -     45C 1  NAMT   -     46C 1  NTAP   -     62C 1  NRT    -     66C 1
KNR    -     72C 1  MWT    -     76C 1  LDW    -    102C 1  LSTP   -    106C 1  BG     -    112C 1  DOUT   -    116C 1
NDTAP  -    122C 1  ITAP   -    126C 1  MTLAB  -    132C 1  PRTDAY -    442C 1  LDWP   -    443C 1  LPSTP  -    444C 1
LSTDA  -    445C 1  IDMDA  -    446C 1  IDMDB  -    447C 1  IDMDC  -    450C 1  IDMDD  -    451C 1  NDIM   -    452C 1
NDIM1  -    453C 1  NDIM2  -    454C 1  NDSK1  -    455C 1  NDSK2  -    456C 1  NDSK3  -    457C 1  NDSK4  -    460C 1
NDSK5  -    461C 1  NDSK6  -    462C 1  NDSK7  -    463C 1  NDSK8  -    464C 1  MSUN   -    465C 1  MSJI   -    466C 1
LMIN1  -    467C 1  LMIN2  -    470C 1  IBSCAN -    471C 1  MSCAN  -    472C 1  EPSL   -    473C 1  ALPHAR -    474C 1
ALPHA1 -    475C 1  PWGT   -    476C 1  DTIME1 -    477C 1  DTIME2 -    500C 1  MSWP   -    501C 1  MCOUNT -    502C 1
MSLCT  -    503C 1  LGLTIJ -    506C 1  XXX    -    536C 1  DAYT   -    574C 1  KDATT  -    575C 1  IBT    -    576C 1
PT     -    577C 1  KT     -   1754C 1  UT     -   1755C 1  VT     -   3132C 1  WT     -   4307C 1  ST     -   5464C 1
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AD-A072 564 MICHIGAN UNIV ANN ARBOR DEPT OF ATMOSPHERIC AND OCE--ETC F/G 8/10
A BRIEF DOCUMENTATION OF THE NORPAX OCEAN MODEL,(U)
APR 77 J C HUANG, W SHAW, J S CHING N00014-76-C-0141

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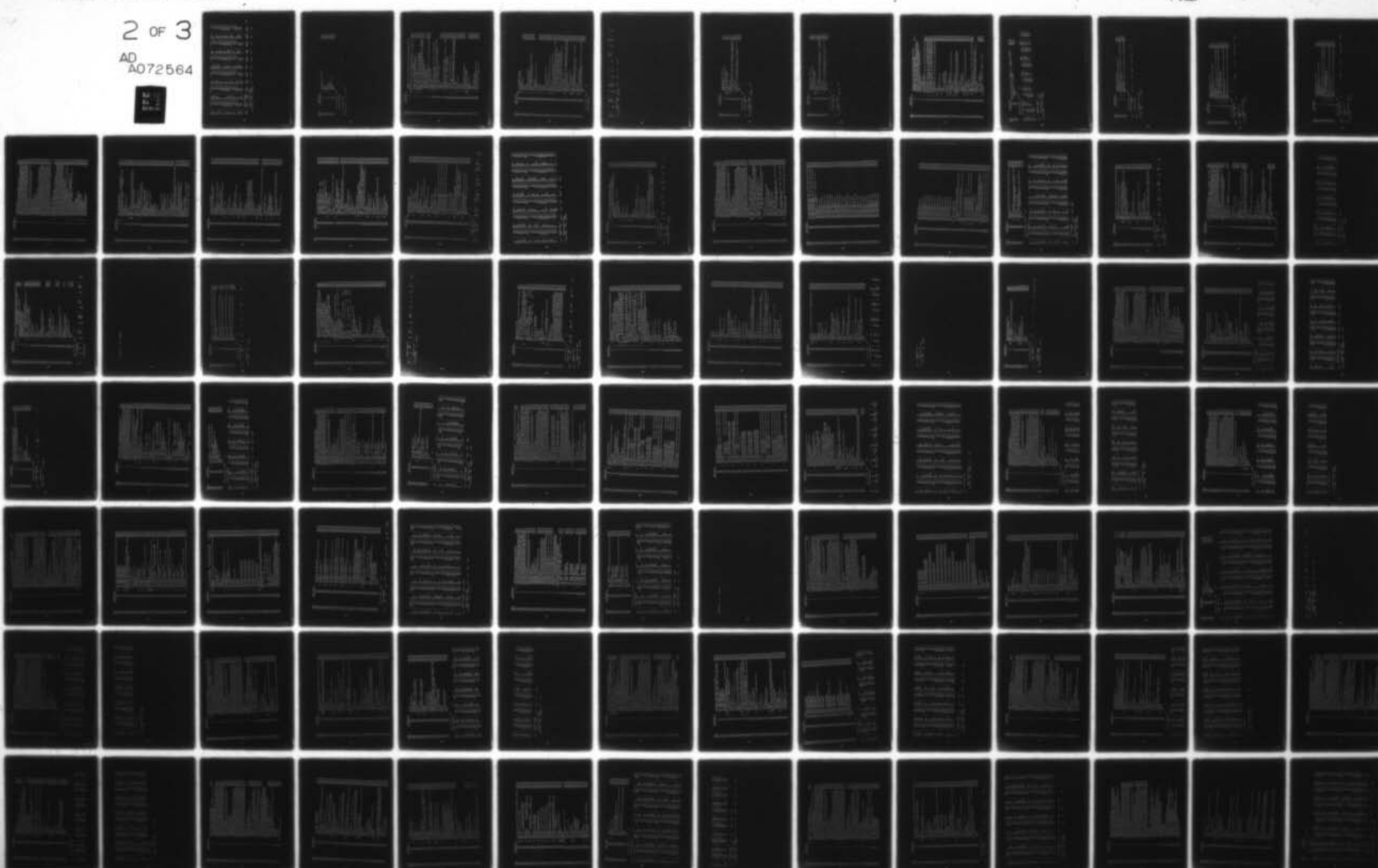
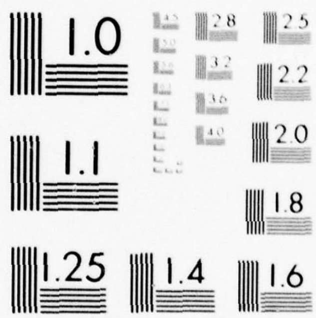
A072564






MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

```
TT      -   6641C 1  PPT     -  10016C 1  RES     -  11173C 1  UTM     -  12350C 1  VTM     -  13525C 1  DAYB    -      0C 2
KDATB   -      1C 2  IMAXT   -      2C 2  VIB     -      3C 2  NIBT    -      4C 2  IUNDF   -      5C 2  RUNDF   -      6C 2
FLAT1   -      7C 2  FLAT2   -     10C 2  FLONG1  -     11C 2  FLONG2  -     12C 2  SO      -     13C 2  TO      -     14C 2
RGO     -     15C 2  ALPHA   -     16C 2  3       -     17C 2  HEATC   -     20C 2  PI      -     21C 2  RE      -     22C 2
G       -     23C 2  VISY    -     24C 2  SVISY   -     25C 2  TVISY   -     26C 2  VISZ    -     27C 2  SVISZ   -     30C 2
TVISZ   -     31C 2  POWER   -     32C 2  TAREA   -     33C 2  UAREA   -     34C 2  TVOL    -     35C 2  UVOL    -     36C 2
TKK     -     37C 2  CSTQ    -     40C 2  CSTE    -     41C 2  SECDAY  -     42C 2  DXT     -     43C 2  DXU     -     76C 2
RDXJ2   -    131C 2  DYT     -    164C 2  DYU     -    165C 2  RDYU2   -    166C 2  EPSSK   -    167C 2  EPSTK   -    201C 2
RUCRIT  -    213C 2  DZ      -    225C 2  DZMH    -    237C 2  Z       -    251C 2  DEPTH   -    263C 2  BETA    -    264C 2
F       -    317C 2  DG      -    352C 2  AYZT    -    364C 2  AUXY    -    376C 2  AXZT    -    431C 2  AXZU    -   1047C 2
AX      -   1465C 2  AY      -   2103C 2  AZ      -   2521C 2  CSX     -   3137C 2  CSY     -   3555C 2  CSZ     -   4173C 2
CTX     -   4205C 2  CTY     -   4623C 2  CTZ     -   5241C 2  VISX    -   5253C 2  SVISX   -   5306C 2  TVISX   -   5341C 2
IBI     -   5374C 2  IMX     -   5375C 2  IMEF1   -   5376C 2  IMEF2   -   5377C 2  JMX     -   5400C 2  JMEF1   -   5401C 2
JMEF2   -   5402C 2  LAN     -   5403C 2  ING     -   5405C 2  INDBL   -   5407C 2  INDBR   -   5442C 2  LSBY    -   5475C 2
IEF1    -   5524C 2  IEF2    -   5557C 2  IND     -   5612C 2  AREAT   -   6767C 2  AREAU   -   6770C 2  VOLT    -   6771C 2
VOLJ    -   6772C 2  AREATB  -   6773C 2  AREAUB  -   6774C 2  VOLTB   -   6775C 2  VOLUB   -   6776C 2  ATXY    -   6777C 2
EPD     -  10154C 2  BP      -      0C 3  DA      -   1160C 3  DB      -   7222C 3  DC      -  15264C 3  LCMNAM  -      0C 4
LCNT    -    347C 4  NR1234  -    356C 4  NR567   -    357C 4  DAYSE   -      0C 5  KDATSE  -      1C 5  ENGE    -      2C 5
PCH     -      7C 5  UCH     -     23C 5  VCH     -    213C 5  WCH     -    403C 5  SCH     -    573C 5  TCH     -    763C 5
ITEM    -   1153C 5  NWDS    -   1154C 5  LEL     -   1155C 5  ENGL    -   1156C 5  FAC     -   2306C 5  IPL     -   2314C 5
IR      -   2322C 5  NPLX    -   2323C 5  DAYX    -      0C 3  KDATX   -      1C 3  IB      -      2C 3  KA      -   1160C 3
KB      -   7222C 3  KC      -  15254C 3  FDAT    -      1C 1  MXPTS   -     10     MSUND   -     11     NTPOT   -   2452
NTAPE   -   2451     LF2     -   2450     START   -   2447     LSTART  -   2446     IDFR    -   2445     NOMT    -   2444
MSLCTX  -   2443     L       -   2442     ITS     -   2441     LABEL   -   2440     SWFR    -   2437     ISTOP   -   2436
LFE     -   2435     NDSKX   -   2434     DAYX1   -   2433     DIFO    -   2432     LR      -   2431     STOL    -   2430
DAYS1   -   2427     LSWCH   -   2426     XMIN    -   2425     XMAX    -   2424     KF      -   2423

         SUBROUTINES CALLED
DATEF  .  OUTPTS     REQLCM     INPUTC     OUTPTC     CSTOUT     FLDYST     GRDCST     WTBUF      REWDTP     RDBUFL     FRCST      RDBUF
LSTCSTI   WTBUFL     CHGTAPE    COLDST     STABOUT    LSTOUT     EXIT       INDINTG    DATPLT     MAINCL     PRTENGX    MPLOT

         COMMON BLOCKS AND LENGTHS
       -  11220      CMN1    -  14702     CMN2    -  11331     CMN3    -  23326     NLCM    -    360     ENSL    -   2324
    COMPILE TIME =     705     MILLISECS
```

```
CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
 422                    0             SUBROUTINE CSTOUT (D,X,N)                                    CSTD.2
 423                    0             IF (X) 1,2,3                                                 CSTD.3
 424                    3        1    N=0                                                          CSTD.4
 425                    4             RETURN                                                       CSTD.5
 426                    5        2    N=1                                                          CSTD.6
 427                    6             RETURN                                                       CSTD.7
 428                    7        3    Y=(X/D)+0.5                                                  CSTD.8
 429                   10             N=INT(Y)                                                     CSTD.9
 430                   14             IF (N .EQ. 0) N=1                                            CSTD.10
 431                   15             RETURN                                                       CSTD.11
 432                   16             END                                                          CSTD.12

        LENGTH OF ROUTINE   CSTOUT         37

        VARIABLE ASSIGNMENTS
D      -      0    X      -      0    N      -      0    Y      -     24

        SUBROUTINES CALLED
DEGRSD
    COMPILE TIME =      10    MILLISECS
```

```
              APPROXIMATE
              PROGRAM LOCATION
                     0           SUBROUTINE FLDYST (KDAT,NAMX,NTPX,ITS,LABEL,KNR,DAYF,DAYX,ISTOP,N,
                     0          1KTPR)
                     0     C INPUT VALUE NTPX = LOGICAL UNIT NO. OF TAPE NTPX.                     FLDY.3
                     0     C INPUT VALUE DAYF =(-1, 0, .GT. 0)=(START NEW TAPE, START BEFORE EOF,  FLDY.4
                     0     C                     START AT DAY=DAYF)                                  FLDY.5
                     0     C    **************RETURN VALUES*******************                     FLDY.6
                     0     C ------DAYX = DAYS OF LAST GROUP-RECORD READ.                            FLDY.7
                     0     C    ISTOP=1, START A NEW TAPE.                                          FLDY.8
                     0     C    ISTOP=2, DAYF .LT. DAYX, END OF FILE NOT REACHED.                   FLDY.9
                     0     C    ISTOP=3, DAYF .EQ. DAYX, END OF FILE NOT REACHED.                   FLDY.10
                     0     C    ISTOP=4, DAYF .GT. DAYX, END OF FILE REACHED, DAYF .NE. 999999999., FLDY.11
                     0     C    ISTOP=5, DAYF .GT. DAYX, END OF FILE REACHED, DAYF .EQ. 999999999., FLDY.12
                     0           DIMENSION NL(4),DAYL(4),LDAY(4),NPE(4)                          FLDY.13
                     0           DIMENSION XX(2),NAMX(3),KTPR(8)
                     0           EQUIVALENCE (XX(2),MDAY)                                        FLDY.15
                     0           DATA LNK,KSY,IDM/4,2H *,2/                                      FLDY.16
                     0       29  FORMAT (/10X,*---READ PARITY ERROR AT *I5,*-TH RECORD, GROUP-RECORFLDY.17
                     0          1D*,I4,*, SUB-RECORD*,I4,*---*)                                  FLDY.18
                     0           ENCODE (2,3,KTPR(2)) NTPX
                    36        3  FORMAT (I2)
                    36     C    *******NCAR*******STAGING IN TAPE NTPX OF LABEL = LABEL*********
                    36           PRINT 80,ITS,NTPX,LABEL,KTPR
                    53       80  FORMAT (/10X,*-----------BEGIN TO USE THE*,I4,*-TH REEL OF TAPE*I2,
                    53          1* LABEL =*A8/ 20X,*TLIB TO BE ASSIGNED ----- *,7A8,I8/)
                    53           CALL NEWVOL (NTPX,LABEL,1,KTPR)
                    61           KEND=5H NOT                                                     FLDY.20
                    61           ISTOP=0                                                         FLDY.21
                    61           NT=N=L=0                                                        FLDY.22
                    61           PRINT 27, KDAT, NTPX, NAMX, ITS, LABEL                          FLDY.23
                   104       27  FORMAT(1H1/15X,A10,15X,*(DAYS) -- LISTING OF TAPE*I2,4H,    ,3A10//FLDY.24
                   104          120X,*TAPE SEQUENCE NO. =*I2,5X,*LABEL=*A8//                      FLDY.25
                   104          1  5X,4(30H     NO.      DAYS      RUN-DATE ))                    FLDY.26
                   104           PRINT 23                                                        FLDY.27
                   104     C     IF (DAYF .NE. 77777777777777777777B) GO TO 9                    FLDY.28
                   104     C     PRINT 4, DAYF                                                   FLDY.29
                   104     C   4  FORMAT (//15X,5H*****, *ASSIGNED DAYS FOR THIS TAPE =*F8.3,* WHICHFLDY.30
                   104     C    1 IS BLANK AND IS NOT ALLOWED.*/20X,*-----JOB TERMINATES ABNORMALLYFLDY.31
                   104     C    2-----*/)                                                        FLDY.32
                   104     C     CALL EXIT                                                       FLDY.33
                   111        9  IF (DAYF) 5,10,10                                               FLDY.34
                   112        5  ISTOP=1                                                         FLDY.35
                   113           K=KNR                                                           FLDY.36
                   113           GO TO 22                                                        FLDY.37
                   116       10  KPAR=0                                                          FLDY.38
                   116           BUFFER IN (NTPX,1) (XX(1),XX(IDM))                              FLDY.39
                   125       15  IF (UNIT,NTPX) 15,12,20,26
                   125     CBKY  IF (UNIT(NTPX)) 12,20,26
                   131       26  KPAR=1                                                          FLDY.41
                   132           PRINT 29, NT,N,K                                                FLDY.42
                   145       12  NT=NT+1                                                         FLDY.43
                   145           K=1                                                             FLDY.44
                   145           N=N+1 $ L=L+1                                                   FLDY.45
                   145           DAYX=XX(1) $ NPE(L)=1H                                          FLDY.46
                   145           NL(L)=N $ DAYL(L)=DAYX $ LDAY(L)=MDAY                           FLDY.47
                   153       40  IF (K .EQ. KNR) GO TO 43                                        FLDY.48
                   155           BUFFER IN (NTPX,1) (XX(1),XX(IDM))                              FLDY.49
```

```
CARD           APPROXIMATE
NUMBER      PROGRAM LOCATION
          165      CBKY  IF (UNIT(NTPX)) 42,20,41
          174        16  IF (UNIT,NTPX) 16,42,20,41
          177        41  KPAR=KPAR+1                                                 FLDY.51
          200            PRINT 29, NT,N,K                                            FLDY.52
          215        42  K=K+1                                                       FLDY.53
          215            NT=NT+1                                                     FLDY.54
          215            GO TO 40                                                    FLDY.55
          221        43  IF (KPAR .NE. 0) NPE(L)=KSY                                 FLDY.56
          225            IF (L .NE. LMX) GO TO 45                                    FLDY.57
          227            PRINT 44, (NPE(I),NL(I),DAYL(I),LDAY(I),I=1,LMX)            FLDY.58
          254        44  FORMAT (5X,4(A2,I5,F12.3,1X,A10))                           FLDY.59
          254            L=0                                                         FLDY.60
          254        45  DIFXF=DAYX-DAYF
          262            IF (ABS(DIFXF) .LT. 1.0E-8) GO TO 46
          263            IF (DIFXF) 10,46,47
          265        46  ISTOP=3                                                     FLDY.62
          265            GO TO 21                                                    FLDY.63
          265        47  ISTOP=2                                                     FLDY.64
          267            GO TO 21                                                    FLDY.65
          270        20  KEND=1H                                                     FLDY.66
          271            ISTOP=4                                                     FLDY.67
          275            IF (DAYF .EQ. 9999999.9) ISTOP=5                            FLDY.68
          277            BACK SPACE NTPX                                             FLDY.69
          301        21  IF (L .EQ. 0) GO TO 22                                      FLDY.70
          303            PRINT 44, (NPE(I),NL(I),DAYL(I),LDAY(I),I=1,L)              FLDY.71
          330        22  PRINT 23                                                    FLDY.72
          335        23  FORMAT (5X,4(30H   ===== ========== ==========))            FLDY.73
          335            PRINT 24, NTPX,NT,N,KNR,DAYX,DAYF,KEND                      FLDY.74
          360        24  FORMAT (/20X,*INPUT FILE READ FROM TAPE*I2/20X,*TOTAL NO. OF RECORFLDY.75
          360           1DS READ =*I5/20X,*NO. OF USER#S GROUP-RECORDS READ =*I5/    FLDY.76
          360           220X,*NO. OF RECORDS PER USER#S GROUP-RECORD =*I5//          FLDY.77
          360           320X,*---DAYS--- OF LAST GROUP-RECORD READ =*F12.4/          FLDY.78
          360           420X,*FINAL ---DAYS--- ASSIGNED TO BE READ =*F12.4//         FLDY.79
          360           520X,*========END OF FILE HAS* A5,*BEEN REACHED.========*//) FLDY.80
          361            IF (K .EQ. KNR) GO TO 36                                    FLDY.81
          363            PRINT 25, K, KNR                                            FLDY.82
          374        25  FORMAT (//15X,*-----STOP AT THE INCOMPLETE SET OF THE GROUP-----*/FLDY.83
          374           125X,*K, KNR =*2I5/10X,*-----CALL FROM SUBROUTINE FLDST, JOB TERMINFLDY.84
          374           1ATES ABNORMALLY-----*/)                                     FLDY.85
          374            CALL EXIT                                                   FLDY.86
          375        36  GO TO (34,32,34,32,31) ISTOP                                FLDY.87
          412        31  IF (N .GT. 0) GO TO 37                                      FLDY.88
          414        32  PRINT 33, DAYF,NTPX                                         FLDY.89
          425        33  FORMAT (//20X,*DAYF =*F14.5,* HAS NOT BEEN FOUND IN TAPE*I2/ FLDY.90
          425           120X,*-----JOB TERMINATES ABNORMALLY-----*/)                 FLDY.91
          425            CALL EXIT                                                   FLDY.92
          426        37  DAYF=DAYX                                                   FLDY.93
          426        34  PRINT 35, NTPX,NAMX,N,DAYF,DAYX                             FLDY.94
          447        35  FORMAT (/10X,*TAPE*I2,3A10,* HAS BEEN READ TILL *I4,*-TH GROUP-RECFLDY.95
          447           10RD OF DAYF=*F14.5,*, DAYX=*F14.5/)                         FLDY.96
          447            RETURN                                                      FLDY.97
          447            END                                                         FLDY.98

     LENGTH OF ROUTINE   FLDYST        766

     VARIABLE ASSIGNMENTS
```

```
KDAT  -     0   NAMX  -     0   NTPX  -     0   ITS   -     0   LABEL -     0   KNR   -     0
DAYF  -     0   DAYX  -     0   ISTUP -     0   N     -     0   KTPK  -     0   NL    -     0
DAYL  -     4   LDAY  -    10   NPE   -    14   XX    -    20   HDAY  -    21   LMX   -    22
KSY   -    23   IDM   -    24   KEND  -   453   NT    -   462   L     -   461   K     -   460
KPAR  -   457   I     -   456   DIFKF -   455

          SUBROUTINES CALLED
OUTPTS    OUTPTC    NEWVOL    BUFFEI    IOCHEK    BACKSP    EXIT      Q8QRSD
     COMPILE TIME =    117    MILLISECS
```

```
CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
 541                  0              SUBROUTINE RDBUF (NTPX,IDM,X)                              RDBF.2
 542                  0              DIMENSION X(IDM)                                           RDBF.3
 543                  0              BUFFER IN (NTPX,1) (X(1),X(IDM))                           RDBF.4
 544                 11          11  IF (UNIT,NTPX) 11,12,13,14                                 RDBF.5
 545                 11        CBKY  IF (UNIT(NTPX)) 12,13,14                                   RDBF.6
 546                 14          12  RETURN                                                     RDBF.7
 547                 15          13  PRINT 15, NTPX                                             RDBF.8
 548                 25          15  FORMAT (10X,*========== END OF FILE OF TAPE *I2,* HAS BEEN REACHEDRDBF.9
 549                 25             1, DURING  INPUT==========*/25X,*---JOB TERMINATES ABNORMALLY---*) RDBF.10
 550                 25              CALL EXIT                                                  RDBF.11
 551                 25          14  PRINT 16, NTPX                                             RDBF.12
 552                 35          16  FORMAT (10X,*-----PARITY ERROR DURING INPUT OF TAPE *I2,*------*/  RDBF.13
 553                 35             125X,*----------JOB TERMINATES ABNORMALLY----------*/)      RDBF.14
 554                 35              CALL EXIT                                                  RDBF.15
 555                 36              END                                                        RDBF.16

      LENGTH OF ROUTINE   RDBUF        107

      VARIABLE ASSIGNMENTS
NTPX   -      0     IDM    -      0     X      -      0

      SUBROUTINES CALLED
BUFFEI    IOCHEK    OUTPTC    EXIT      Q8QRSD
    COMPILE TIME =     12    MILLISECS
```

```
CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
 556                 0                SUBROUTINE *TBUF (NTPX,IDM,X)                                          *TBF.2
 557                 0                DIMENSION X(IDM)                                                       *TBF.3
 558                 0                BUFFER OUT (NTPX,1) (X(1),X(IDM))                                      *TBF.4
 559                11          11    IF (UNIT,NTPX) 11,12,13,14                                             *TBF.5
 560                11        CBKY    IF (UNIT(NTPX)) 12,13,14                                               *TBF.6
 561                14          12    RETURN                                                                 *TBF.7
 562                15          13    PRINT 15, NTPX                                                         *TBF.8
 563                25          15    FORMAT (10X,*========== END OF FILE OF TAPE *I2,* HAS BEEN REACHED*TBF.9
 564                25               1, DURING OUTPUT==========*/25X,*---JOB TERMINATES ABNORMALLY---*)    *TBF.10
 565                25                CALL EXIT                                                              *TBF.11
 566                25          14    PRINT 16, NTPX                                                         *TBF.12
 567                35          16    FORMAT (10X,*-----PARITY ERROR DURING OUTPUT OF TAPE *I2,*-----*/     *TBF.13
 568                35               125X,*----------JOB TERMINATES ABNORMALLY----------*/)                  *TBF.14
 569                35                CALL EXIT                                                              *TBF.15
 570                36                END                                                                    *TBF.16

          LENGTH OF ROUTINE   *TBUF        107

          VARIABLE ASSIGNMENTS
NTPX   -       0      IDM    -       0       X       -       0

          SUBROUTINES CALLED
BUFFEO    IOCHEK    OUTPTC    EXIT      Q8QRSD
    COMPILE TIME =     13    MILLISECS
```

```
CARD        APPROXIMATE
NUMBER    PROGRAM LOCATION
 571             0              SUBROUTINE REQLCM (NIB,KMAX,NDIM1,NDIM2,IDMDB,IDMDC,MAXI)
 572             0              COMMON/NLCM/LCMNAM(33,7),LCNT(7),NR1234,NR567                    RQLM.3
 573             0              COMMON/QTST/DAYFR,KDATFR,IBFR,TAIR(23,27),QT(23,27),STX(23,27),
 574             0             1STY(23,27), IDMQT,IDMF2,IDMF4,LCMFR(65),LCMFRD,NORDER,PERIOD,MAXFR
 575             0             1,RPERD(2),KIND2,KIND4,CAG1,CAG2,CRB1,CRB2,BB2,BB12,AA2,AA12,BVT,
 576             0             XBV2,CI2,CI3,CB2,CB3,CB4,CH1,CE1,CTX1,DAYSC,XABF(541)
 577             0              LCMFRD=LCMREQ(IDMF2)
 578             5              DO 2 I=1,MAXI
 579             5            2 LCMFR(I)=LCMREQ(IDMF4)
 580             5        C  *************FOR NDSK1,2,3,4 ARE ALL LCM*****************************RQLM.4
 581            15              DO 2002 L=1,3                                                    RQLM.5
 582            15        C     *************FOR NDSK1,2,3,4 ARE ALL LCM*****END*******************RQLM.6
 583            15        C     *************FOR NDSK1,2,3,4 ARE ALL DISK**************************RQLM.7
 584            15        C     -------BY PASS ALL STATEMENT TILL STATEMENT 2002 (INCLUDED)---------RQLM.8
 585            15        C     *************FOR NDSK1,2,3,4 ARE ALL DISK*********END**************RQLM.9
 586            15        C     *************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM**************RQLM.10
 587            15        C     DO 2002 L=3,4                                                    RQLM.11
 588            15        C     *************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM******END*****RQLM.12
 589            15              I=J=0                                                            RQLM.13
 590            15         2001 J=J+1                                                            RQLM.14
 591            15              I=I+1 $ K=0                                                      RQLM.15
 592            15              LCMNAM(I,L)=LCMREQ(NDIM1)                                        RQLM.16
 593            15         2003 K=K+1                                                            RQLM.17
 594            15              I=I+1                                                            RQLM.18
 595            15              LCMNAM(I,L)=LCMREQ(NDIM2)                                        RQLM.19
 596            15              IF (K .LT. KMAX) GO TO 2003                                      RQLM.20
 597            15              IF (J .LT. NIB) GO TO 2001                                       RQLM.21
 598            15         2002 CONTINUE                                                         RQLM.22
 599            54              DO 2004 I=1,NIB                                                  RQLM.23
 600            54         2004 LCMNAM(I,5)=LCMREQ(IDMDB)                                        RQLM.24
 601            54        C  *********FOR NDSK6, NDSK7 ARE DISKS ******************              RQLM.25
 602            54        C     DO 2005 L=6,7                                                    RQLM.26
 603            54        C     DO 2005 I=1,NIB                                                  RQLM.27
 604            54        C2005 LCMNAM(I,L)=LCMREQ(IDMDC)                                        RQLM.28
 605            54        C  ****END******NDSK6,7 ARE DISKS***************************           RQLM.29
 606            54        C  *********FOR NDSK6, NDSK7 ARE LCM *********************             RQLM.30
 607            66              L=6 $ LP1=7                                                      RQLM.31
 608            66              DO 2005 I=1,NIB                                                  RQLM.32
 609            66              LCMNAM(I,L)=LCMREQ(IDMDC)                                        RQLM.33
 610            66              LCMNAM(I,LP1)=LCMNAM(I,L)                                        RQLM.34
 611            66         2005 CONTINUE                                                         RQLM.35
 612            66        C     ****END******NDSK6,7 ARE LCM****************************         RQLM.36
 613           103              DO 2006 L=1,7                                                    RQLM.37
 614           103         2006 CALL REWDTP (L)                                                  RQLM.38
 615           112              IRMK=(KMAX+1)*NIB                                                RQLM.39
 616           112              PRINT 2010                                                       RQLM.40
 617           123         2010 FORMAT (1H1/20X,*========== LCM ADDRESS TABLE FOR BOTH BKY-FTN ANDRQLM.41
 618           123            1 NCAR SYSTEMS ==========*/)                                       RQLM.42
 619           123              PRINT 3, LCMFRD,LCMFRD, (I,LCMFR(I),LCMFR(I),I=1,MAXI)
 620           150            3 FORMAT (/3X,*LCMFRD =*I10,2X,O20//3X,*LCMFR(I) =*/(2X,3(I6,3H)   ,
 621           150             1I10,2X,O20)))
 622           150              DO 2009 L=1,7                                                    RQLM.43
 623           150              IF (L .GT. 4) IRMX=NIB                                           RQLM.44
 624           150              PRINT 2007, L,LCNT(L), IRMX                                      RQLM.45
 625           172              PRINT 2008, (I, LCMNAM(I,L), LCMNAM(I,L),I=1,IRMX)               RQLM.46
 626           215         2009 CONTINUE                                                         RQLM.47
```

```
CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
 627                217      2007 FORMAT (/10X,*LCM NAME REQUEST --- L, LCNT(L), IRMX =*3I6/)      RQLM.48
 628                217      2008 FORMAT (2X,3(4IH     I  LCMNAM(I,L)    LCMNAM(I,L) IN OCT.)/        RQLM.49
 629                217         1(2X,3(I6,3H)   ,I10,2X,O20)))                                         RQLM.50
 630                217           RETURN                                                            RQLM.51
 631                220           END                                                               RQLM.52

        LENGTH OF ROUTINE    REQLCM       317

        VARIABLE ASSIGNMENTS
NIB      -       0    KMAX     -       0    NDIM1    -       0    NDIM2    -       0    IOMDB    -       0    IOMDC    -       0
MAXI     -       0    LCMNAM   -      0C 0  LCNT     -    347C 0  NR1234   -    356C 0  NR567    -    357C 0  DAYFR    -      0C 1
KDATFR   -     1C 1   IBFR     -      2C 1  TAIR     -      3C 1  QT       -   1160C 1  STX      -   2335C 1  STY      -   3512C 1
IOMQT    -  4667C 1   IOMF2    -   4670C 1  IOMF4    -   4671C 1  LCMFR    -   4672C 1  LCMFRD   -   4773C 1  NORDER   -   4774C 1
PERIOD   -  4775C 1   MAXFR    -   4776C 1  RPERD    -   4777C 1  KIND2    -   5001C 1  KIND4    -   5002C 1  CAG1     -   5003C 1
CAG2     -  5004C 1   CRB1     -   5005C 1  CRB2     -   5006C 1  BB2      -   5007C 1  BB12     -   5010C 1  AA2      -   5011C 1
AA12     -  5012C 1   BVT      -   5013C 1  BV2      -   5014C 1  CI2      -   5015C 1  CI3      -   5016C 1  CB2      -   5017C 1
CB3      -  5020C 1   C34      -   5021C 1  CH1      -   5022C 1  CE1      -   5023C 1  CTX1     -   5024C 1  DAYSC    -   5025C 1
XABF     -  5026C 1   I        -     233    L        -     232    J        -     231    K        -     230    LP1      -     227
IRMX     -    225

        SUBROUTINES CALLED
LCMRED    REWDTP     OUTPTC      DBORSD

        COMMON BLOCKS AND LENGTHS
NLCM     -    360     QTST    -    6053
    COMPILE TIME =      77     MILLISECS
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
 632                 0               SUBROUTINE REWDTP (NDSKX)                                          REWD.2
 633                 0               COMMON/NLCM/LCMNAM(33,7),LCNT(7),NR1234,NR567                      REWD.3
 634                 0               LCNT(NDSKX)=0                                                      REWD.4
 635                 0      C   *************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM****************REWD.5
 636                 0      C        IF (NDSKX .GT. 2) RETURN                                           DKLC.34
 637                 0      C        REWIND NDSKX                                                       DKLC.35
 638                 0      C   *************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM*******END*******REWD.8
 639                 2               END                                                                REWD.9

          LENGTH OF ROUTINE   REWDTP        14

          VARIABLE ASSIGNMENTS
NDSKX   -       0      LCMNAM -      0C 0  LCNT   -    347C 0  NR1234 -    356C 0  NR567   -    357C 0

          SUBROUTINES CALLED
Q8QRSD

          COMMON BLOCKS AND LENGTHS
NLCM    -    360
    COMPILE TIME =       4    MILLISECS.
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
 640                 0             SUBROUTINE RDBJFL (NDSKX,IDM,X)                                   RDBL.2
 641                 0             DIMENSION X(IDM)                                                  RDBL.3
 642                 0             COMMON/NLCM/LCMNAM(33,7),LCNT(7),NR1234,NR567                     RDBL.4
 643                 0             LCNT(NDSKX)=LCNT(NDSKX)+1                                         RDBL.5
 644                 2             I=LCNT(NDSKX)                                                     RDBL.6
 645                 2      C    **************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM***************RDBL.7
 646                 2      C      IF (NDSKX .LT. 3) GO TO 30                                        RDBL.8
 647                 2      C    **************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM*******END******RDBL.9
 648                 2             CALL LCMRD (LCMNAM(I,NDSKX),X,IDM)                                RDBL.10
 649                 2      CBKY   CALL READEC (X,LCMNAM(I,NDSKX),IDM)                               RDBL.11
 650                14             RETURN                                                            RDBL.12
 651                14      C    **************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM***************RDBL.13
 652                14      C 30   CALL RDBUF (NDSKX,IDM,X)                                          RDBL.14
 653                14      C      RETURN                                                            RDBL.15
 654                14      C    **************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM*******END******RDBL.16
 655                14             END                                                               RDBL.17

        LENGTH OF ROUTINE   RDBJFL        30

        VARIABLE ASSIGNMENTS
NDSKX  -       0    IDM     -      0     X       -      0      LCMNAM -      0C 0  LCNT    -    347C 0  NR1234 -    356C 0
NR567  -    357C 0  I       -     22

        SUBROUTINES CALLED
LCMRD    QBORSD

        COMMON BLOCKS AND LENGTHS
NLCM   -    360
   COMPILE TIME =      8    MILLISECS
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CARD             APPROXIMATE
NUMBER         PROGRAM LOCATION
 656                  0              SUBROUTINE WTBUFL (NDSKX,IDM,X)                                       WTBL.2
 657                  0              DIMENSION X(1D4)                                                      WTBL.3
 658                  0              COMMON/NLCM/LCMNAM(33,7),LCNT(7),NR1234,NR567                         WTBL.4
 659                  0              LCNT(NDSKX)=LCNT(NDSKX)+1                                             WTBL.5
 660                  2              I=LCNT(NDSKX)                                                         WTBL.6
 661                  2      C   *************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM****************WTBL.7
 662                  2      C       IF (NDSKX .LT. 3) GO TO 30                                            WTBL.8
 663                  2      C   *************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM*******END*******WTBL.9
 664                  2              CALL LCMWT (LCMNAM(I,NDSKX),X,IDM)                                    WTBL.10
 665                  2      CBKY    CALL WRITEC (X,LCMNAM(I,NDSKX),IDM)                                   WTBL.11
 666                 14              RETURN                                                                WTBL.12
 667                 14      C   *************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM****************WTBL.13
 668                 14      C 30    CALL WTBUF (NDSKX,IDM,X)                                              WTBL.14
 669                 14      C       RETURN                                                                WTBL.15
 670                 14      C   *************FOR NDSK1,2 ARE DISK AND NDSK3,4 ARE LCM*******END*******WTBL.16
 671                 14              END                                                                   WTBL.17

         LENGTH OF ROUTINE    WTBUFL        30

         VARIABLE ASSIGNMENTS
NDSKX  -        0   IDM    -      0     X      -       0     LCMNAM -      OC 0  LCNT    -    347C 0  NR1234 -    356C 0
NR567  -     357C 0  I      -     22

         SUBROUTINES CALLED
LCMWT     Q8QRSD

         COMMON BLOCKS AND LENGTHS
NLCM    -    360
    COMPILE TIME =       9    MILLISECS
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CARD             APPROXIMATE
NUMBER         PROGRAM LOCATION
 672                 0          SUBROUTINE GRDCST                                                    GRDC.2
 673                 0      C  ========== BEGINING OF DIMENSION CHANGE  ==========                   GRDC.3
 674                 0          COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,GRDC.4
 675                 0         1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)GRDC.5
 676                 0         2,NAMX(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)GRDC.6
 677                 0         3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,    GRDC.7
 678                 0         3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,GRDC.8
 679                 0         3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANGRDC.9
 680                 0         4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),GRDC.10
 681                 0         4LGLTIJ(2,4,3),XXX(30)                                                GRDC.11
 682                 0         4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23,  GRDC.12
 683                 0         527),TT(23,27),  PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        GRDC.13
 684                 0          EQUIVALENCE (NCARD,N)                                                GRDC.14
 685                 0          DIMENSION XUVR(2484)                                                 GRDC.15
 686                 0          EQUIVALENCE (PPT(1),XUVR(1))                                         GRDC.16
 687                 0          DIMENSION BT(624),DT(3106)                                           GRDC.17
 688                 0          EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                                  GRDC.18
 689                 0          COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,      GRDC.19
 690                 0         1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,    GRDC.20
 691                 0         2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,GRDC.21
 692                 0         3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITGRDC.22
 693                 0         4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),   GRDC.23
 694                 0         1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),   GRDC.24
 695                 0         6CSK(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX(  GRDC.25
 696                 0         727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   GRDC.26
 697                 0         8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND(  GRDC.27
 698                 0         923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)GRDC.28
 699                 0         1,EPD(23,27)
 700                 0          DIMENSION X(2812),Y(2013)
 701                 0          EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                   GRDC.31
 702                 0      C  ********** ENDING OF DIMENSION CHANGE  ****************               GRDC.32
 703                 0          EQUIVALENCE (XXX(1),COS1,H1,RCRP,AURO),(XXX(2),COS2,H2,RCPT),(XXX(GRDC.33
 704                 0         13),RPI,AXM),(XXX(4),OMEGA,AYS),(XXX(5),DLONG,AYH),(XXX(6),DLAT,AMYGRDC.34
 705                 0         2),(XXX(7),RDLON,AMZ),(XXX(8),EPST),(XXX(9),EPSS),(XXX(10),EPSTA),  GRDC.35
 706                 0         3(XXX(11),ZEUN),(XXX(12),FLAT),(XXX(13),KM1),(XXX(14),RCPU),(XXX(15GRDC.36
 707                 0         4),AYM),(XXX(16),AXS),(XXX(17),AXH),(XXX(18),AZM),(XXX(19),BL),(XXXGRDC.37
 708                 0         5(20),ICARD),(XXX(21),ISYB),(XXX(22),IGOTO),(XXX(23),II1),(XXX(24),GRDC.38
 709                 0         6II2),(XXX(25),LFE),(XXX(26),UNDEF),(XXX(27),II8)                  GRDC.39
 710                 0          DATA PI,G,RE,TKK/3.1415926,981.0,6.375E8,273.1/                     GRDC.40
 711                 0          DATA C1,C2,C3,PC,POWER,IUNDF/0.25,0.5,0.75,1.0E8,1.3333333333,-99/GRDC.41
 712                 0      C   RDXU2(J)=0.5/DXU(J) $ RDYU2=0.5/DYU                                 GRDC.42
 713                 0      C   BETA(J)=(F(J)-F(J-1))*0.5 FOR J .GE. 2  AND BETA(1)=0.0             GRDC.43
 714                 0          DATA PI,G,RE,TKK/3.1415926,981.0,6.375E8,273.2/                     GRDC.44
 715                 0      C   ATXY(I,J)=DXT(J)*DYT*(1.0,0.25,0.5,0.75)  DEPENDS ON IND(I,J)       GRDC.45
 716                 0      C   AUXY(J)=DXU(J)*DYU       DYU=DYT                                    GRDC.46
 717                 0      C   AYZT(K)=DYT*DZ(K)                                                   GRDC.47
 718                 0      C   AXZT(J,K)=DXT(J)*DZ(K)                                              GRDC.48
 719                 0      C   AXZU(J,K)=DXU(J)*DZ(K)                                              GRDC.49
 720                 0      C   CSX(J,K)=SVISX(J)*AYZT(K)/DXT(J)                                    GRDC.50
 721                 0      C   CTX(J,K)=TVISX(J)*AYZT(K)/DXT(J)                                    GRDC.51
 722                 0      C   CSY(J,K)=SVISY*AXZU(J,K)/DYT                                        GRD00722
 723                 0      C   CTY(J,K)=TVISY*AXZU(J,K)/DYT                                        GRDC.53
 724                 0      C   CSZ(K)=SVISZ/DZMH(K)                                                GRDC.54
 725                 0      C   CTZ(K)=TVISZ/DZMH(K)                                                GRDC.55
 726                 0      C   AX(J,K)=VISX(J)*AYZT(K)/DXU(J)                                      GRDC.56
 727                 0      C   AY(J,K)=VISY*AXZT(J,K)/DYT                                          GRDC.57
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CARD           APPROXIMATE
NUMBER       PROGRAM LOCATION
 728              0   C        AZ(J,K)=VISZ*AJXY(J)/DZMH(K)                                 GRDC.58
 729              0   C        EPST =TO/DEPTH (DEPTH IN CM)   $   EPSS=ALPHA*EPST/B         GRDC.59
 730              0   C        EPSSK(K)=EPSS*DZMH(K)  $  EPSTK(K)=EPST*DZMH(K)  (IN COMMON) GRDC.60
 731              0   C        RDCRIT(K)=2.0*ALPHA*EPST*DZMH(K)        (IN COMMON)          GRDC.61
 732              0            NTPOT=NTPO1                                                  GRDC.62
 733              6            DAYB=DAYS+DIFDAY                                             GRDC.63
 734             13            IF (DAYS .EQ. 0.0) DAYB=0.0                                  GRDC.64
 735             14            KDATB=KDAT                                                   GRDC.65
 736             14            ZEUN=0.0                                                     GRDC.66
 737             14       80   FORMAT (6F10.4)                                              GRDC.67
 738             14       82   FORMAT (/10X,*Z(K), DEPTH  (IN UNIT OF METER)*/(20X,10F10.4)) GRDC.68
 739             14       84   FORMAT (/10X,* VISY,SVISY,TVISY,VISZ,SVISZ,TVISZ =*6F10.4)   GRDC.69
 740             14            READ 80, FLAT1,FLAT2, FLONG1,FLONG2                          GRDC.70
 741             33            READ 80, Z,DEPTH                                             GRDC.71
 742             44            PRINT 82, Z,DEPTH                                            GRDC.72
 743             55            READ 81, TO,SO,RDO,HEATC,ALPHA,B                             GRDC.73
 744             76       81   FORMAT (4F10.4,2F10.7)                                       GRDC.74
 745             76            READ 80, VISY,SVISY,TVISY,VISZ,SVISZ,TVISZ                   GRDC.75
 746            117            PRINT 84,  VISY,SVISY,TVISY,VISZ,SVISZ,TVISZ                 GRDC.76
 747            140            RPI=PI/180.0                                                 GRDC.77
 748            140            FLONG1=FLONG1*RPI $ FLONG2=FLONG2*RPI                        GRDC.78
 749            140            FLAT1=FLAT1*RPI $ FLAT2=FLAT2*RPI                            GRDC.79
 750            140            OMEGA=4.0*PI/SECDAY                                          GRDC.80
 751            140            DLONG=(FLONG2-FLONG1)/FLOAT(MAXI-1)                          GRDC.81
 752            140            IMAXT=MAXI                                                   GRDC.82
 753            140            DLAT=(FLAT2-FLAT1)/FLOAT(JMAX-1)                             GRDC.83
 754            140            OMEGA=OMEGA/DLAT                                             GRDC.84
 755            140            RDLON=RE*DLONG                                               GRDC.85
 756            140            COS2=COS(FLAT1)                                              GRDC.86
 757            167            DXT(1)=RDLON*COS2                                            GRDC.87
 758            167            FLAT=FLAT1                                                   GRDC.88
 759            167            DO 50 J=2,JMAX                                               GRDC.89
 760            167            JM1=J-1                                                      GRDC.90
 761            167            COS1=COS2                                                    GRDC.91
 762            167            FLAT=FLAT+DLAT $ COS2=COS(FLAT)                              GRDC.92
 763            167            DXT(J)=RDLON*COS2                                            GRDC.93
 764            167            DXJ(JM1)=0.5*(DXT(JM1)+DXT(J))                               GRDC.94
 765            167            F(JM1)=OMEGA*(COS1-COS2)                                     GRDC.95
 766            167       50   CONTINUE                                                     GRDC.96
 767            220            DXJ(JMAX)=0.0 $ F(JMAX)=F(JM1)                               GRDC.97
 768            220            DYT=RE*DLAT                                                  GRDC.98
 769            220            DYJ=DYT $ RDYU2=0.5/DYU                                      GRDC.99
 770            220            K=1 $ Z(K)=Z(K)*100.0 $ H1=Z(K)                              GRDC.100
 771            220            DEPTH=DEPTH*100.0                                            GRDC.101
 772            220            EPST=(TO+TKK)/(DEPTH*10000.)$EPSS=ALPHA*EPST/B$EPSTA=2.*ALPHA*EPST
 773            220            DZMH(1)=EPSSK(1)=EPSTK(1)=RDCRIT(1)=ZEUN                     GRDC.103
 774            220            DO 2 K=2,KMAX                                                GRDC.104
 775            220            KM1=K-1 $ Z(K)=Z(K)*100.0 $ DZMH(K)=Z(K)-Z(KM1)              GRDC.105
 776            220            H2=0.5*DZMH(K) $ DZ(KM1)=H1+H2 $ H1=H2                       GRDC.106
 777            220            EPSSK(K)=EPSS*DZMH(K) $ EPSTK(K)=EPST*DZMH(K)                GRDC.107
 778            220            RDCRIT(K)=EPSTA*DZMH(K)                                      GRDC.108
 779            220        2   CONTINUE                                                     GRDC.109
 780            275            DZ(KMAX)=H1+DEPTH-Z(KMAX)                                    GRDC.110
 781            275            VISY=VISY*PC $ SVISY=SVISY*PC $ TVISY=TVISY*PC               GRDC.111
 782            275            DO 5 J=J1,J2                                                 GRDC.112
 783            275            RCPU=(DXJ(J)/DYJ)**POWER $ VISX(J)=VISY*RCPU                 GRDC.113
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CARD          APPROXIMATE
NUMBER      PROGRAM LOCATION
 784             275             RCPT=(DXT(J)/DYT)**POWER                                          GRDC.114
 785             275             SVISX(J)=SVISY*RCPT $ TVISX(J)=TVISY*RCPT                         GRDC.115
 786             275             IF (J .NE. JMAX) RDXU2(J)=0.5/DXU(J)                              GRDC.116
 787             275         5   CONTINUE                                                          GRDC.117
 788             344             RDXU2(JMAX)=0.0                                                   GRDC.118
 789             344             AYS=SVISY/DYT $ AYH=TVISY/DYT $ AYM=VISY/DYT                      GRDC.119
 790             344             DO 10 K=1,KMAX                                                    GRDC.120
 791             344             AYZT(K)=DYT*DZ(K) $ DG(K)=DZMH(K)*G                               GRDC.121
 792             344             IF (DZMH(K) .EQ. 0.0) GO TO 11                                    GRDC.122
 793             344             CSZ(K)=SVISZ/DZMH(K) $ CTZ(K)=TVISZ/DZMH(K)                       GRDC.123
 794             344             GO TO 10                                                          GRDC.124
 795             344        11   CSZ(K)=CTZ(K)=ZERO                                                GRDC.125
 796             344        10   CONTINUE                                                          GRDC.126
 797             374             DO 20 J=J1,J2                                                     GRDC.127
 798             374             IF (J .EQ. 1) GO TO 8                                             GRDC.128
 799             374             BETA(J)=(F(J)-F(J-1))*0.5                                         GRDC.129
 800             374             GO TO 9                                                           GRDC.130
 801             374         8   BETA(J)=0.0                                                       GRDC.131
 802             374         9   AUXY(J)=DXU(J)*DYT                                                GRDC.132
 803             374             IF (DXT(J) .EQ. 0.0) GO TO 15                                     GRDC.133
 804             374             AXS=SVISX(J)/DXT(J) $ AXH=TVISX(J)/DXT(J)                         GRDC.134
 805             374             GO TO 16                                                          GRDC.135
 806             374        15   AXS=AXH=0.0                                                       GRDC.136
 807             374        16   IF (DXU(J) .EQ. 0.0) GO TO 17                                     GRDC.137
 808             374             AXM=VISX(J)/DXU(J)                                                GRDC.138
 809             374             GO TO 18                                                          GRDC.139
 810             374        17   AXM=0.0                                                           GRDC.140
 811             374        18   AZM=VISZ*AUXY(J)                                                  GRDC.141
 812             374             DO 20 K=1,KMAX                                                    GRDC.142
 813             440             AXZT(J,K)=DXT(J)*DZ(K) $ AXZU(J,K)=DXU(J)*DZ(K)                   GRDC.143
 814             440             CSX(J,K)=AXS*AYZT(K) $ CTX(J,K)=AXH*AYZT(K)                       GRDC.144
 815             440             CSY(J,K)=AXZU(J,K)*AYS $ CTY(J,K)=AXZU(J,K)*AYH                   GRDC.145
 816             440             AX(J,K)=AYZT(K)*AXM  $  AY(J,K)=AXZT(J,K)*AYM                     GRDC.146
 817             440             IF (DZMH(K) .EQ. 0.0) GO TO 19                                    GRDC.147
 818             440             AZ(J,K)=AZM/DZMH(K)                                               GRDC.148
 819             440             GO TO 20                                                          GRDC.149
 820             440        19   AZ(J,K)=ZERO                                                      GRDC.150
 821             440        20   CONTINUE                                                          GRDC.151
 822             505             CSTE=SECDAY*90.0
 823             505             CSTD=RDD*HEATC
 824             505       C  **************START READ IN NIB BLOCKS OF DATA OF (I,J)************  GRDC.153
 825             505             IB=0                                                              GRDC.154
 826             505             CALL LSTCSTI (IB)                                                 GRDC.155
 827             515               TVOL=UVOL=TAREA=UAREA=0.0                                       GRDC.156
 828             515       200   IB=IB+1                                                           GRDC.157
 829             520             BL=FLOAT(IB)                                                      GRDC.158
 830             520             VOLT=VOLU=AREAT=AREAU=0.0 $ K=0                                   GRDC.159
 831             525             AREATB=AREAUB=VOLTB=VOLUB=0.0                                     GRDC.160
 832             525       301   FORMAT (I4,A4,I2,6X,16I4)                                         GRDC.161
 833             525             KSYB=4HEFIJ                                                       GRDC.162
 834             525             N=N+1                                                             GRDC.163
 835             525             READ 301, ICARD,ISYB,IBI, IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,        GRDC.164
 836             525            1 (LAN(I),ING(I),I=1,2)                                            GRDC.165
 837             575             IGOTO=1                                                           GRDC.166
 838             575             GO TO 210                                                         GRDC.167
 839             600       111   IF (IMX .NE. IMAX) GO TO 220                                      GRDC.168
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CARD          APPROXIMATE
NUMBER      PROGRAM LOCATION
 840             603           IF (JMX .NE. JMAX) GO TO 220                                      GRDC.169
 841             605           KSYB=4HINDL $ INKD=2 $ J=1                                        GRDC.170
 842             610           CALL CRDINP (N,KSYB,IB,INKD,JMAX,J,  INDBL)                       GRDC.171
 843             621           KSYB=4HINDR $ INKD=2 $ J=1                                        GRDC.172
 844             624           CALL CRDINP (N,KSYB,IB,INKD,JMAX,J,  INDBR)                       GRDC.173
 845             635           KSYB=4HSYBL $ INKD=1 $ J=1                                        GRDC.174
 846             640           CALL     CRDINP (N,KSYB,IB,INKD,IMAX,J,  LSBY)                    GRDC.175
 847             651           KSYB=4HIEFJ $ II2=0 $ IGOTO=2                                     GRDC.176
 848             656       113 IF (II2 .EQ. JMAX) GO TO 114                                      GRDC.177
 849             660           II1=II2+1  $ II2=II2+8                                            GRDC.178
 850             665           IF (II2 .GT. JMAX) II2=JMAX                                       GRDC.179
 851             667           N=N+1                                                             GRDC.180
 852             667           READ 301, ICARD,ISYB,IB1, (IEF1(I),IEF2(I),I=II1,II2)             GRDC.181
 853             717           GO TO 210                                                         GRDC.182
 854             720       114 INKD=2 $ KSYB=4HINDX                                              GRDC.183
 855             720           CALL     CRDINP (N,KSYB,IB,INKD,IMAX,JMAX,IND)                    GRDC.184
 856             733           NAMX(1)=10HINPUTDATA  $ NAMX(3)=10H                               GRDC.185
 857             733           KSYB=4HEPIJ $ INKD=3 $ LFE=1
 858             733           NAMX(2)=10H EMP(I,J)                                              GRDC.199
 859             733           CALL     CRDINP (N,KSYB,IB,INKD,IMAX,JMAX,EPD)                    GRDC.200
 860             754           CALL STABOUT (NAMX,NTPDT,KDAT,IMAX,JMAX,DAYS,IB,K,LFE,LSBY,EPD)  GRDC.201
 861             771           DO 54 J=J1,J2                                                     GRDC.210
 862             771           DO 54 I=I1,I2                                                     GRDC.212
 863             772           ATXY(I,J)=UNDEF                                                   GRDC.213
 864             772           IF (IND(I,J) .EQ. IUNDF) GO TO 54                                 GRDC.214
 865             772           IF (IND(I,J) .GE. 0) GO TO 21                                     GRDC.215
 866             772           IIB=ING(1)-1                                                      GRDC.216
 867             772           IF (I .NE. IIB) GO TO 22                                          GRDC.217
 868             772           INDEX=INDBL(J)                                                    GRDC.218
 869             772           GO TO 24                                                          GRDC.219
 870             772        22 IIB=ING(2)+1                                                      GRDC.220
 871             772           IF (I .EQ. IIB) GO TO 23                                          GRDC.221
 872             772     C  XXXXXXXXXX PRINT ERROR MESSAGE XXXXXXXXXX                            GRDC.222
 873             772           PRINT 26,IB,ING,(INDBL(N),INDBR(N),N=1,JMAX)                      GRDC.223
 874            1053        26 FORMAT (//10X,*XXXXX INCONSISTENT OF ING(I) AND INDBL(J),INDBR(J) GRDC.224
 875            1053         1XXXXX CALLED FROM GRDCSD*//15X,*-----JOB TERMINATES ABNORMALLY----GRDC.225
 876            1053         1-*//     20X,* FOR BLOCK IB =*I4, *  ING(1),ING(2) =*2I5/          GRDC.226
 877            1053         1 8X,*(INDBL(J),INDBR(J),J=1,JMAX)=*10(I5,I4)/(37X,10(I5,I4)))     GRDC.227
 878            1053           CALL EXIT                                                         GRDC.228
 879            1054        23 INDEX=INDBR(J)                                                    GRDC.229
 880            1061        24 IF (INDEX .LT. 0) GO TO 54                                        GRDC.230
 881            1062           ATXY(I,J)=DXT(J)*DYT                                              GRDC.231
 882            1071           IF (INDEX .EQ. 0) GO TO 34                                        GRDC.232
 883            1072           GO TO 25                                                          GRDC.233
 884            1072        21 ATXY(I,J)=DXT(J)*DYT                                              GRDC.234
 885            1073           INDEX=IND(I,J)                                                    GRDC.235
 886            1102           IF (INDEX     .EQ. 0) GO TO 34                                    GRDC.236
 887            1104        25 GO TO (32,32,31,33,33,33,32,32,31,31,31,33) INDEX                 GRDC.237
 888            1126        31 ATXY(I,J)=ATXY(I,J)*C1                                            GRDC.238
 889            1126           GO TO 34                                                          GRDC.239
 890            1133        32 ATXY(I,J)=ATXY(I,J)*C2                                            GRDC.240
 891            1134           GO TO 34                                                          GRDC.241
 892            1141        33 ATXY(I,J)=ATXY(I,J)*C3                                            GRDC.242
 893            1151        34 IF (INDEX .GT.6) GO TO 36                                         GRDC.243
 894            1153           AREAU=AREAJ+AUXY(J)                                               GRDC.244
 895            1153           DO 35 K=1,KMAX                                                    GRDC.246
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       APPROXIMATE
    PROGRAM LOCATION
          1153      35  VOLU=VOLU+AUXY(J)*DZ(K)                                         GRDC.247
          1167      36  AREAT=AREAT+ATXY(I,J)                                           GRDC.248
          1170          EPD(I,J)=EPD(I,J)*ATXY(I,J)/CSTE                                GRDC.250
          1170          DO 37 K=1,KMAX                                                  GRDC.251
          1170      37  VOLT=VOLT+ATXY(I,J)*DZ(K)                                       GRDC.252
          1220          IF (IND(I,J) .LT. 0) GO TO 54                                   GRDC.253
          1227          IF (IND(I,J) .GT. 6) GO TO 39                                   GRDC.254
          1231          JAREA=JAREA+AJXY(J) $ AREAUB=AREAUB+AUXY(J)                     GRDC.255
          1231          DO 38 K=1,KMAX                                                  GRDC.256
          1231          VXYZU=AJXY(J)*DZ(K)                                             GRDC.257
          1231          VOLUB=VOLUB+VXYZU $ JVOL=UVOL+VXYZU                             GRDC.258
          1231      38  CONTINUE                                                        GRDC.259
          1252      39  TAREA=TAREA+ATXY(I,J) $ AREATB=AREATB+ATXY(I,J)                 GRDC.260
          1252          DO 40 K=1,KMAX                                                  GRDC.261
          1252          VXYZT=ATXY(I,J)*DZ(K)                                           GRDC.262
          1252          VOLTB=VOLTB+VXYZT $ TVOL=TVOL+VXYZT                             GRDC.263
          1252      40  CONTINUE                                                        GRDC.264
          1276      54  CONTINUE                                                        GRDC.265
          1304          CALL WTBUFL(NDSK5,ID4DB,Y)                                      GRDC.266
          1312          CALL LSTCSTI (IB)                                               GRDC.267
          1316          IF (IB .NE. NIB) GO TO 200                                      GRDC.268
          1320          PRINT 122, TAREA,TVOL, UAREA,UVOL                               GRDC.269
          1335     122  FORMAT (1H1//                                                   GRDC.270
          1335         120X,*TOTAL EFFECTIVE  AREA  ABOUT FULL-GRID POINT (FOR ALL BLOCKS)GRDC.271
          1335         1 = TAREA =*E16.8,6H CM**2/                                      GRDC.272
          1335         120X,*TOTAL EFFECTIVE VOLUME ABOUT HALF-GRID POINT (FOR ALL BLOCKS)GRDC.273
          1335         1 =  TVOL =*E16.8,6H CM**3/                                      GRDC.274
          1335         120X,*TOTAL EFFECTIVE  AREA  ABOUT HALF-GRID POINT (FOR ALL BLOCKS)GRDC.275
          1335         1 = JAREA =*E16.8,6H CM**2/                                      GRDC.276
          1335         120X,*TOTAL EFFECTIVE VOLUME ABOUT FULL-GRID POINT (FOR ALL BLOCKS)GRDC.277
          1335         1 =  UVOL =*E16.8,6H CM**3/)                                     GRDC.278
          1335          RETURN                                                          GRDC.279
          1337     210  IF (ICARD .NE. N) GO TO 209                                     GRDC.280
          1342          IF (ISYB .NE. KSYB) GO TO 209                                   GRDC.281
          1345          IF (IBI .NE. IB) GO TO 209                                      GRDC.282
          1347          GO TO (111,113) IGOTO                                           GRDC.283
          1357     209  PRINT 218, N,KSYB, IB, ICARD,ISYB,IBI                           GRDC.284
          1400     218  FORMAT (1H1//10X,100(1H*)//20X,*INPUT DATA-CARDS NOT IN ORDER*// GRDC.285
          1400         120X,*CARD NO., SYMBOL, BLOCK NO. SHOULD BE *I5,2X,A10,I5/       GRDC.286
          1400         120X,*                  BUT, NOW THEY ARE    *I5,2X,A10,I5/      GRDC.287
          1400         2/25X,*==========JOB TERMINATES ABNORMALLY==========*/)          GRDC.288
          1400          CALL EXIT                                                       GRDC.289
          1401     220  PRINT 230, IMAX,JMAX, IMX,JMX                                   GRDC.290
          1416     230  FORMAT (//20X,100(1H*)//20X,*IMAX, JMAX SHOULD BE *2I5//        GRDC.291
          1416         1 29X,*NOW THEY ARE *2I5/                                        GRDC.292
          1416         2/25X,*==========JOB TERMINATES ABNORMALLY==========*/)          GRDC.293
          1416          CALL EXIT                                                       GRDC.294
          1417          END                                                             GRDC.295

     LENGTH OF ROUTINE   GRDCST      1701

     VARIABLE ASSIGNMENTS
XUVR  -  10015C 0  BT      -   574C 0  DT     -  1754C 0  X      -     0C 1  Y     -  5374C 1  DAYS   -     0C 0
XDAT  -      1C 0  DIFDAY  -     2C 0  DTIME  -     3C 0  DAYEND -     4C 0  MAXI  -     5C 0  IMAX   -     6C 0
JMAX  -      7C 0  KMAX    -    10C 0  IM1    -    11C 0  JM1    -    12C 0  IP1   -    13C 0  JP1    -    14C 0
I1    -     15C 0  J1      -    16C 0  I2     -    17C 0  J2     -    20C 0  I     -    21C 0  J      -    22C 0
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K      -    23C 0  NCARD1 -    24C 0  NCARD  -    25C 0  KSYB   -    26C 0  INKD   -    27C 0  INDEX  -    30C 0
ITIL   -    31C 0  NAMX   -    41C 0  VTPD1  -    44C 0  NTPD2  -    45C 0  NAMT   -    46C 0  NTAP   -    62C 0
VRT    -    66C 0  KVR    -    72C 0  MWT    -    76C 0  LDW    -   102C 0  LSTP   -   106C 0  BG     -   112C 0
DOUT   -   115C 0  NDTAP  -   122C 0  ITAP   -   126C 0  MTLAB  -   132C 0  PRTDAY -   442C 0  LDWP   -   443C 0
LPSTP  -   444C 0  LSTDA  -   445C 0  IDMDA  -   446C 0  IDMDB  -   447C 0  IDMDC  -   450C 0  IDMDD  -   451C 0
VDIM   -   452C 0  NDIM1  -   453C 0  VDIM2  -   454C 0  NDSK1  -   455C 0  NDSK2  -   456C 0  NDSK3  -   457C 0
NDSK4  -   460C 0  NDSK5  -   461C 0  NDSK6  -   462C 0  NDSK7  -   463C 0  NDSK8  -   464C 0  MSUN   -   465C 0
MSUI   -   466C 0  LMIN1  -   467C 0  LMIN2  -   470C 0  IBSCAN -   471C 0  MSCAN  -   472C 0  EPSL   -   473C 0
ALPHAR -   474C 0  ALPHA1 -   475C 0  PWGT   -   476C 0  DTIME1 -   477C 0  DTIME2 -   500C 0  MSWP   -   501C 0
MCOUNT -   502C 0  MSLCT  -   503C 0  LGLTIJ -   506C 0  XXX    -   536C 0  DAYT   -   574C 0  KDATT  -   575C 0
IBT    -   576C 0  PT     -   577C 0  KT     -  1754C 0  UT     -  1755C 0  VT     -  3132C 0  WT     -  4307C 0
ST     -  5464C 0  TT     -  6641C 0  PPT    - 10016C 0  RES    - 11173C 0  UTM    - 12350C 0  VTM    - 13525C 0
DAYB   -     0C 1  KDATB  -     1C 1  IMAXT  -     2C 1  NIB    -     3C 1  NIBT   -     4C 1  IUNDF  -     5C 1
RUNDF  -     6C 1  FLAT1  -     7C 1  FLAT2  -    10C 1  FLONG1 -    11C 1  FLONG2 -    12C 1  SO     -    13C 1
TO     -    14C 1  ROD    -    15C 1  ALPHA  -    16C 1  B      -    17C 1  HEATC  -    20C 1  PI     -    21C 1
RE     -    22C 1  G      -    23C 1  VISY   -    24C 1  SVISY  -    25C 1  TVISY  -    26C 1  VISZ   -    27C 1
SVISZ  -    30C 1  TVISZ  -    31C 1  POWER  -    32C 1  TAREA  -    33C 1  UAREA  -    34C 1  TVOL   -    35C 1
UVOL   -    36C 1  TKK    -    37C 1  CSTQ   -    40C 1  CSTE   -    41C 1  SECDAY -    42C 1  DXT    -    43C 1
DXU    -    76C 1  RDXU2  -   131C 1  DYT    -   164C 1  DYU    -   165C 1  RDYU2  -   166C 1  EPSSK  -   167C 1
EPSTK  -   201C 1  ROCRIT -   213C 1  DZ     -   225C 1  DZMH   -   237C 1  Z      -   251C 1  DEPTH  -   263C 1
BETA   -   264C 1  F      -   317C 1  DG     -   352C 1  AYZT   -   364C 1  AUXY   -   376C 1  AXZT   -   431C 1
AXZU   -  1047C 1  AX     -  1465C 1  AY     -  2103C 1  AZ     -  2521C 1  CSX    -  3137C 1  CSY    -  3555C 1
CSZ    -  4173C 1  CTX    -  4205C 1  CTY    -  4623C 1  CTZ    -  5241C 1  VISX   -  5253C 1  SVISX  -  5306C 1
TVISX  -  5341C 1  IBI    -  5374C 1  IMX    -  5375C 1  IMEF1  -  5376C 1  IMEF2  -  5377C 1  JMX    -  5400C 1
JMEF1  -  5401C 1  JMEF2  -  5402C 1  LAN    -  5403C 1  ING    -  5405C 1  INDBL  -  5407C 1  INDBR  -  5442C 1
LSBY   -  5475C 1  IEF1   -  5524C 1  IEF2   -  5557C 1  IND    -  5612C 1  AREAT  -  6767C 1  AREAU  -  6770C 1
VOLT   -  6771C 1  VOLU   -  6772C 1  AREATB -  6773C 1  AREAUB -  6774C 1  VOLTB  -  6775C 1  VOLUB  -  6776C 1
ATXY   -  6777C 1  EPD    - 10154C 1  V      -    25C 0  COS1   -   536C 0  H1     -   536C 0  RCRP   -   536C 0
AJRD   -   536C 0  COS2   -   537C 0  H2     -   537C 0  RCPT   -   537C 0  RPI    -   540C 0  AXM    -   540C 0
OMEGA  -   541C 0  AYS    -   541C 0  DLONG  -   542C 0  AYH    -   542C 0  DLAT   -   543C 0  AMY    -   543C 0
RDLDY  -   544C 0  AMZ    -   544C 0  EPST   -   545C 0  EPSS   -   546C 0  EPSTA  -   547C 0  ZEJN   -   550C 0
FLAT   -   551C 0  KM1    -   552C 0  RCPU   -   553C 0  AYM    -   554C 0  AXS    -   555C 0  AXH    -   556C 0
AZM    -   557C 0  BL     -   560C 0  ICARD  -   561C 0  ISYB   -   562C 0  IGOTO  -   563C 0  III    -   564C 0
II2    -   565C 0  LFE    -   566C 0  UNDEF  -   567C 0  IIB    -   570C 0  C1     -     0     C2     -     1
C3     -     2     PC     -     3     VTPOT  -  1425     IB     -  1424     VXYZU  -  1423     VXYZT  -  1422

        SUBROUTINES CALLED
INPUTC    OUTPTC    COSF      RBAREX    LSTCSTI   CRDINP    GTABOUT   EXIT      WTBUFL

        COMMON BLOCKS AND LENGTHS
CMN1   -  14702     CMN2   -  11331
    COMPILE TIME =     490     MILLISECS
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CARD          APPROXIMATE
NUMBER        PROGRAM LOCATION
 944              0             SUBROUTINE CRDINP (N,KSYB,IB,INKD,IMX,JMX,X)                         CRDI.2
 945              0       C  ****READ INPUT DATA-CARDS FOR X(I,J) IN SEQUENCE****                    CRDI.3
 946              0       C          ===========FOR INPUT DATA OF TYPE INKD===========               CRDI.4
 947              0       C  -----VARIALE FOR TEMP. USE ARE I,J,III,II2,ICARD,ISYB,IBI-----          CRDI.5
 948              0             DIMENSION X(IMX,JMX)                                                 CRDI.6
 949              0             DIMENSION IFMT(3)                                                    CRDI.7
 950              5             IFMT(1)=10H(I4,A4,I2, $ IFMT(2)=10H6X,                               CRDI.8
 951              5             GO TO (11,12,13) INKD                                                CRDI.9
 952             21        11   IFMT(3)=3H8A8)                                                       CRDI.10
 953             21             NIC=8                                                                CRDI.11
 954             21             GO TO 15                                                             CRDI.12
 955             24        12   IFMT(3)=8H16I4)                                                      CRDI.13
 956             24             NIC=16                                                               CRDI.14
 957             24             GO TO 15                                                             CRDI.15
 958             27        13   IFMT(3)=8H8F8.3)                                                     CRDI.16
 959             27             NIC=8                                                                CRDI.17
 960             27        15   J=0                                                                  CRDI.18
 961             32        30   J=J+1                                                                CRDI.19
 962             33             II2=0                                                                CRDI.20
 963             33        20   III=II2+1                                                            CRDI.21
 964             36             II2=II2+NIC                                                          CRDI.22
 965             43             IF (II2 .GT. IMX) II2=IMX                                            CRDI.23
 966             45             READ IFMT, ICARD,ISYB,IBI,(X(I,J),I=III,II2)                         CRDI.24
 967             72        10   N=N+1                                                                CRDI.25
 968             74             IF (ICARD .NE. N) GO TO 50                                           CRDI.26
 969             77             IF (IBI .NE. IB) GO TO 50                                            CRDI.27
 970            102             IF (ISYB .NE. KSYB) GO TO 50                                         CRDI.28
 971            105             IF (II2 .NE. IMX) GO TO 20                                           CRDI.29
 972            110             IF (J .NE. JMX) GO TO 30                                             CRDI.30
 973            112             RETURN                                                               CRDI.31
 974            112        50   PRINT 51, N,KSYB, IB, ICARD,ISYB,IBI                                 CRDI.32
 975            134        51   FORMAT (1H1//10X,100(1H*)//20X,*INPUT DATA-CARDS NOT IN ORDER*//     CRDI.33
 976            134            120X,*CARD NO., SYMBOL, BLOCK NO. SHOULD BE *I5,2X,A10,I5/            CRDI.34
 977            134            120X,*                 BUT, NOW THEY ARE   *I5,2X,A10,I5/             CRDI.35
 978            134            2/25X,*==========JOB TERMINATES ABNORMALLY==========*/)               CRDI.36
 979            134             CALL EXIT                                                            CRDI.37
 980            135             END                                                                  CRDI.38

        LENGTH OF ROUTINE   CRDINP        232

        VARIABLE ASSIGNMENTS
N     -      0     KSYB   -      0     IB    -      0     INKD   -      0     IMX   -      0     JMX   -      0
X     -      0     IFMT   -      0     NIC   -    152     J      -    151     II2   -    150     III   -    147
ICARD -    146     ISYB   -    145     IBI   -    144     I      -    143

        SUBROUTINES CALLED
INPUTC     OUTPTC     EXIT       Q8Q2SD
    COMPILE TIME =      44    MILLISECS
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CARD          APPROXIMATE
NUMBER      PROGRAM LOCATION
 981              0          SUBROUTINE  LSTCSTI (IB)                                         LSTC.2
 982              0     C  ========== BEGINING OF DIMENSION CHANGE  ==========               LSTC.3
 983              0          COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,LSTC.4
 984              0         1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)LSTC.5
 985              0         2,NAMK(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)LSTC.6
 986              0         3,LSTP(4),BG(4),DOUT(4),NDTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  LSTC.7
 987              0         3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,LSTC.8
 988              0         3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANLSTC.9
 989              0         4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),LSTC.10
 990              0         4LGLTIJ(2,4,3),XXX(30)                                            LSTC.11
 991              0         4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, LSTC.12
 992              0         627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)       LSTC.13
 993              0          DIMENSION XUVR(2484)                                             LSTC.14
 994              0          EQUIVALENCE (PPT(1),XUVR(1))                                     LSTC.15
 995              0          DIMENSION BT(624),DT(3106)                                       LSTC.16
 996              0          EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                              LSTC.17
 997              0          COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,    LSTC.18
 998              0         1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   LSTC.19
 999              0         2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTO,CSTE,SECDAY,LSTC.20
1000              0         3DXT(27),DXJ(27),RDXJ2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITLSTC.21
1001              0         4(10),DZ(10),DZ4H(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  LSTC.22
1002              0         1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  LSTC.23
1003              0         6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISK( LSTC.24
1004              0         727),SVISX(27),TVISX(27),   IB1,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   LSTC.25
1005              0         8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( LSTC.26
1006              0         923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)LSTC.27
1007              0         1,EPD(23,27)                                                      LSTC.28
1008              0     C  ********** ENDING OF DIMENSION CHANGE  ****************           LSTC.29
1009              0       81  FORMAT (/10X,*FLAT1,FLAT2, FLONG1,FLONG2   =*4F10.4)            LSTC.30
1010              0       83  FORMAT (/10X,*TO,SO,ROO,ALPHA,B,HEATC=*6E15.7)                  LSTC.31
1011              0       85  FORMAT (/10X,*CONSTANTS DEFINED IN DATA STATEMENT IN SUBROUTINE GRLSTC.32
1012              0         1OCST ---*/20X,*G = GRAVITATIONAL ACCELERATION =*F8.3,* (CM/SEC/SECLSTC.33
1013              0         2)*/20X,*RE= RADIUS OF EARTH =*E16.8,* (CM)*/19X,*TKK=0.0 DEGREE C LSTC.34
1014              0         3=*F8.3,* (DEGREE KELVIN)*/ 20X,3HPI=,F14.8)                      LSTC.35
1015              0       86  FORMAT (/10X,*CSTO, CSTE, SECDAY, POWER  =*4E16.8)              LSTC.36
1016              0       88  FORMAT (/10X,*DAYB, KDATB =*F12.4,5X,A10/                       LSTC.37
1017              0          1          /10X,*IMAXT, NIB, NIBT, IUNDF=(IUNDF),*,25X,*RUNDF=(RUNDF)LSTC.38
1018              0          1*             /10X,3I5,I8,2H=(,O20,1H),E16.8,2H=(,O20,1H)/)      LSTC.39
1019              0          NTPOT=NTPO1                                                      LSTC.40
1020              4          IF (IB .NE. 0) GO TO 10                                          LSTC.41
1021             11          IF (LSTDA .EQ. 0 .OR. LSTDA .EQ. 2) RETURN                       LSTC.42
1022             13          PRINT 81,  FLAT1,FLAT2, FLONG1,FLONG2                            LSTC.43
1023             30          PRINT 83,  TO,SO,ROO,ALPHA,B,HEATC                               LSTC.44
1024             51          PRINT 85, G,RE,TKK,PI                                            LSTC.45
1025             66          PRINT 86, CSTO,CSTE,SECDAY,POWER                                 LSTC.46
1026            104          IF (IMAXT .EQ. MAXI) GO TO 5                                     LSTC.47
1027            105          PRINT 4, IMAXT, MAXI                                             LSTC.48
1028            117        4  FORMAT (//10X,100(1H-)/20X,*IMAXT, MAXI =*2I5,*  SHOULD BE THE SAMLSTC.49
1029            117         1E*/25X,*-----JOB TERMINATES ABNORMALLY-----*/)                   LSTC.50
1030            117          CALL EXIT                                                        LSTC.51
1031            120        5  CONTINUE                                                        LSTC.52
1032            120          PRINT 88, DAYB,KDATB,IMAXT, NIB, NIBT, IUNDF, IUNDF, RUNDF, RUNDF LSTC.53
1033            147          PRINT 122, TAREA,TVOL, UAREA,UVOL                                LSTC.54
1034            164     122  FORMAT (//                                                       LSTC.55
1035            164         120X,*TOTAL EFFECTIVE  AREA  ABOUT FULL-GRID POINT (FOR ALL BLOCKS)LSTC.56
1036            164          1 = TAREA =*E16.8,6H CM**2/                                      LSTC.57
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CARD          APPROXIMATE
NUMBER      PROGRAM LOCATION
1037             164        120X,*TOTAL EFFECTIVE VOLUME ABOUT HALF-GRID POINT (FOR ALL BLOCKS)LSTC.58
1038             164        1 =  TVOL =*E16.8,6H CM**3/                                        LSTC.59
1039             164        120X,*TOTAL EFFECTIVE  AREA  ABOUT HALF-GRID POINT (FOR ALL BLOCKS)LSTC.60
1040             164        1 = UAREA =*E16.8,6H CM**2/                                        LSTC.61
1041             164        120X,*TOTAL EFFECTIVE VOLUME ABOUT FULL-GRID POINT (FOR ALL BLOCKS)LSTC.62
1042             164        1 =  UVOL =*E16.8,6H CM**3/)                                       LSTC.63
1043             164         NAMX(1)=10HDYT          $ NAMX(2)=2H    $ NAMX(3)=2H    $ J=K=1   LSTC.64
1044             164         CALL PRTDJK (NAMX,J,K,DYT)                                        LSTC.65
1045             177         NAMX(1)=10HDYU                                                    LSTC.66
1046             177         CALL PRTDJK (NAMX,J,K,DYU)                                        LSTC.67
1047             206         NAMX(1)=10HRDYJ2                                                  LSTC.68
1048             206         CALL PRTDJK (NAMX,J,K,RDYU2)                                      LSTC.69
1049             215         NAMX(1)=10HDXT(J)                                                 LSTC.70
1050             215         CALL PRTDJK (NAMX,JMAX,K, DXT)                                    LSTC.71
1051             224         NAMX(1)=10HDXU(J)                                                 LSTC.72
1052             224         CALL PRTDJK (NAMX,JMAX,K, DXU)                                    LSTC.73
1053             233         NAMX(1)=10HRDXJ2(J)                                               LSTC.74
1054             233         CALL PRTDJK (NAMX,JMAX,K,RDXU2)                                   LSTC.75
1055             242         NAMX(1)=10HAUXY(J)                                                LSTC.76
1056             242         CALL PRTDJK (NAMX,JMAX,K,AUXY)                                    LSTC.77
1057             251         NAMX(1)=10H   F(J)                                                LSTC.78
1058             251         CALL PRTDJK (NAMX,JMAX,K,F)                                       LSTC.79
1059             260         NAMX(1)=10HBETA(J)                                                LSTC.80
1060             260         CALL PRTDJK (NAMX,JMAX,K,BETA)                                    LSTC.81
1061             267         NAMX(1)=10HSVISX(J)                                               LSTC.82
1062             267         CALL PRTDJK (NAMX,JMAX,K,SVISX)                                   LSTC.83
1063             276         NAMX(1)=10HSVISY                                                  LSTC.84
1064             276         CALL PRTDJK (NAMX,J,K,SVISY)                                      LSTC.85
1065             305         NAMX(1)=10HSVISZ                                                  LSTC.86
1066             305         CALL PRTDJK (NAMX,J,K,SVISZ)                                      LSTC.87
1067             314         NAMX(1)=10HTVISX(J)                                               LSTC.88
1068             314         CALL PRTDJK (NAMX,JMAX,K,TVISX)                                   LSTC.89
1069             323         NAMX(1)=10HTVISY                                                  LSTC.90
1070             323         CALL PRTDJK (NAMX,J,K,TVISY)                                      LSTC.91
1071             332         NAMX(1)=10HTVISZ                                                  LSTC.92
1072             332         CALL PRTDJK (NAMX,J,K,TVISZ)                                      LSTC.93
1073             341         NAMX(1)=10H VISX(J)                                               LSTC.94
1074             341         CALL PRTDJK (NAMX,JMAX,K, VISX)                                   LSTC.95
1075             350         NAMX(1)=10H VISY                                                  LSTC.96
1076             350         CALL PRTDJK (NAMX,J,K, VISY)                                      LSTC.97
1077             357         NAMX(1)=10H VISZ                                                  LSTC.98
1078             357         CALL PRTDJK (NAMX,J,K, VISZ)                                      LSTC.99
1079             366         NAMX(1)=10H Z(K)                                                  LSTC.100
1080             366         CALL PRTDJK (NAMX,KMAX,J,Z)                                       LSTC.101
1081             375         NAMX(1)=10HDEPTH                                                  LSTC.102
1082             375         CALL PRTDJK (NAMX,J,K,DEPTH)                                      LSTC.103
1083             404         NAMX(1)=10HDZ(K)                                                  LSTC.104
1084             404         CALL PRTDJK (NAMX,KMAX,J,DZ)                                      LSTC.105
1085             413         NAMX(1)=10HDZMH(K)                                                LSTC.106
1086             413         CALL PRTDJK (NAMX,KMAX,J,DZMH)                                    LSTC.107
1087             422         NAMX(1)=10HEPSSK(K)                                               LSTC.108
1088             422         CALL PRTDJK (NAMX,KMAX,J,EPSSK)                                   LSTC.109
1089             431         NAMX(1)=10HEPSTK(K)                                               LSTC.110
1090             431         CALL PRTDJK (NAMX,KMAX,J,EPSTK)                                   LSTC.111
1091             440         NAMX(1)=10HROCRIT(K)                                              LSTC.112
1092             440         CALL PRTDJK (NAMX,KMAX,J,ROCRIT)                                  LSTC.113
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CARD          APPROXIMATE
NUMBER      PROGRAM LOCATION
1093            447                NAMX(1)=10HDG(K)                                                     LSTC.114
1094            447                CALL PRTDJK (NAMX,KMAX,J,DG)                                         LSTC.115
1095            456                NAMX(1)=10HAYZT(K)                                                   LSTC.116
1096            456                CALL PRTDJK (NAMX,KMAX,J,AYZT)                                       LSTC.117
1097            465                NAMX(1)=10HAXZT(J,K)                                                 LSTC.118
1098            465                CALL PRTDJK (NAMX,JMAX,KMAX,AXZT)                                    LSTC.119
1099            474                NAMX(1)=10HAXZU(J,K)                                                 LSTC.120
1100            474                CALL PRTDJK (NAMX,JMAX,KMAX,AXZU)                                    LSTC.121
1101            503                NAMX(1)=10HCSX(J,K)                                                  LSTC.122
1102            503                CALL PRTDJK (NAMX,JMAX,KMAX,CSX)                                     LSTC.123
1103            512                NAMX(1)=10HCSY(J,K)                                                  LSTC.124
1104            512                CALL PRTDJK (NAMX,JMAX,KMAX,CSY)                                     LSTC.125
1105            521                NAMX(1)=10H CSZ(K)                                                   LSTC.126
1106            521                CALL PRTDJK (NAMX,KMAX,J,CSZ)                                        LSTC.127
1107            530                NAMX(1)=10HCTX(J,K)                                                  LSTC.128
1108            530                CALL PRTDJK (NAMX,JMAX,KMAX,CTX)                                     LSTC.129
1109            537                NAMX(1)=10HCTY(J,K)                                                  LSTC.130
1110            537                CALL PRTDJK (NAMX,JMAX,KMAX,CTY)                                     LSTC.131
1111            546                NAMX(1)=10H CTZ(K)                                                   LSTC.132
1112            546                CALL PRTDJK (NAMX,KMAX,J,CTZ)                                        LSTC.133
1113            555                NAMX(1)=10HAX(J,K)                                                   LSTC.134
1114            555                CALL PRTDJK (NAMX,JMAX,KMAX,AX)                                      LSTC.135
1115            564                NAMX(1)=10HAY(J,K)                                                   LSTC.136
1116            564                CALL PRTDJK (NAMX,JMAX,KMAX,AY)                                      LSTC.137
1117            573                NAMX(1)=10HAZ(J,K)                                                   LSTC.138
1118            573                CALL PRTDJK (NAMX,JMAX,KMAX,AZ)                                      LSTC.139
1119            602                RETURN                                                               LSTC.140
1120            604          10    IF (IB .NE. IBI) GO TO 20                                            LSTC.141
1121            607                IF (IMX .NE. IMAX) GO TO 30                                          LSTC.142
1122            612                IF (JMX .NE. JMAX) GO TO 30                                          LSTC.143
1123            617                IF (LSTDA .EQ. 0 .OR. LSTDA .EQ. 1) RETURN                           LSTC.144
1124            621                CALL INDTABL(KDAT,IMAX,JMAX,IB,LSBY,IEF1,IEF2,IMEF1,IMEF2,JMEF1,     LSTC.145
1125            621               1 JMEF2,IND)                                                          LSTC.146
1126            637                PRINT 305, IMAX,IMEF1,IMEF2,JMAX,JMEF1,JMEF2                         LSTC.147
1127            660         305    FORMAT (25X,*IMAX, IMEF1, IMEF2 = *3I8/25X,*JMAX, JMEF1, JMEF2 = *LSTC.148
1128            660               13I8)                                                                 LSTC.149
1129            660                PRINT 306, (LAN(I),ING(I),I=1,2)                                     LSTC.150
1130            677         306    FORMAT (24X,* (LAN(I),ING(I),I=1,2)*,4I8/)                           LSTC.151
1131            677                PRINT 307, (INDBL(I),I=1,JMAX)                                       LSTC.152
1132            713         307    FORMAT (10X,* LEFT BOUNDARY INDEX = INDBL(J) =*20I4/(43X,20I4))      LSTC.153
1133            713                PRINT 308, (INDBR(I),I=1,JMAX)                                       LSTC.154
1134            727         308    FORMAT (10X,*RIGHT BOUNDARY INDEX = INDBR(J) =*20I4/(43X,20I4))      LSTC.155
1135            727                PRINT 1000, (LSBY(I),I=1,IMAX)                                       LSTC.156
1136            743        1000    FORMAT (10X,*LSBY=*14A8/(15X,14A8))                                  LSTC.157
1137            743                LFE=2 $ K=0                                                          LSTC.158
1138            743                NAMX(1)=10HCALCULATED $ NAMX(3)=10H                                  LSTC.159
1139            743                NAMX(2)=10H ATXY(I,J)                                                LSTC.164
1140            743                CALL STABOUT (NAMX,NTPOT,KDAT,IMAX,JMAX,DAYB,IB,K,LFE,LSBY,ATXY)     LSTC.165
1141            766                PRINT 121, AREATB,AREAT, VOLTB,VOLT, AREAUB,AREAU, VOLUB,VOLU        LSTC.166
1142           1013         121    FORMAT (/69X,12H(NO OVERLAP),10X,13H(HAS OVERLAP)/                   LSTC.167
1143           1013               115X,*TOTAL  AREA  ABOUT FULL-GRID POINT OF THIS BLOCK =*2(E16.8,     LSTC.168
1144           1013               27H CM**2 )/                                                          LSTC.169
1145           1013               115X,*TOTAL VOLUME ABOUT FULL-GRID POINT OF THIS BLOCK =*2(E16.8,     LSTC.170
1146           1013               27H CM**3 )/                                                          LSTC.171
1147           1013               115X,*TOTAL  AREA  ABOUT HALF-GRID POINT OF THIS BLOCK =*2(E16.8,     LSTC.172
1148           1013               27H CM**2 )/                                                          LSTC.173
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
1149                1013            115X,*TOTAL VOLUME ABOUT HALF-GRID POINT OF THIS BLOCK =*2(E16.8,  LSTC.174
1150                1013            27H CM**3 ))                                                       LSTC.175
1151                1013              RETURN                                                           LSTC.184
1152                1013         20   PRINT 21, IB, IBI                                                LSTC.185
1153                1025         21   FORMAT (//10X,100(1H-)/20X,*IB, IBI =*2I5 *  WHICH ARE NOT THE SAMLSTC.186
1154                1025            1E.*//20X,*---------JOB TERMINATES ABNORMALLY--------*/)           LSTC.187
1155                1025              CALL EXIT                                                        LSTC.188
1156                1026         30   PRINT 22, IMX, IMAX, JMX, JMAX                                   LSTC.189
1157                1043         22   FORMAT(/10X,* IMX, IMAX, JMX, JMAX =*4I6 *  (NOT CONSISTENT)*/   LSTC.190
1158                1043            125X,*---------JOB TERMINATES ABNORMALLY--------*/)                LSTC.191
1159                1043              CALL EXIT                                                        LSTC.192
1160                1044              END                                                              LSTC.193

          LENGTH OF ROUTINE   LSTCSTI      1514

          VARIABLE ASSIGNMENTS
IB      -       0     XUVR    -  10016C 0  BT      -    574C 0  DT      -   1754C 0  DAYS    -      0C 0  KDAT    -     1C 0
DIFDAY  -      2C 0   DTIME   -      3C 0  DAYEND  -      4C 0  MAXI    -      5C 0  IMAX    -      6C 0  JMAX    -     7C 0
KMAX    -     10C 0   IM1     -     11C 0  JM1     -     12C 0  IP1     -     13C 0  JP1     -     14C 0  I1      -    15C 0
J1      -     16C 0   I2      -     17C 0  J2      -     20C 0  I       -     21C 0  J       -     22C 0  K       -    23C 0
NCARD1  -     24C 0   NCARD   -     25C 0  KSYB    -     26C 0  INKD    -     27C 0  INDEX   -     30C 0  ITIL    -    31C 0
NAMX    -     41C 0   NTPO1   -     44C 0  NTPO2   -     45C 0  NAMT    -     46C 0  NTAP    -     62C 0  NRT     -    66C 0
KAR     -     72C 0   MWT     -     76C 0  LOW     -    102C 0  LSTP    -    106C 0  BG      -    112C 0  DOUT    -   116C 0
NOTAP   -    122C 0   ITAP    -    126C 0  MTLAB   -    132C 0  PRTDAY  -    442C 0  LOWP    -    443C 0  LPSTP   -   444C 0
LSTDA   -    445C 0   IDMDA   -    446C 0  IDMDB   -    447C 0  IDMDC   -    450C 0  IDMDD   -    451C 0  NDIM    -   452C 0
NDIM1   -    453C 0   NDIM2   -    454C 0  NDSK1   -    455C 0  NDSK2   -    456C 0  NDSK3   -    457C 0  NDSK4   -   460C 0
NDSK5   -    461C 0   NDSK6   -    462C 0  NDSK7   -    463C 0  NDSK8   -    464C 0  MSUN    -    465C 0  MSJI    -   466C 0
LMIN1   -    467C 0   LMIN2   -    470C 0  IBSCAN  -    471C 0  MSCAN   -    472C 0  EPSL    -    473C 0  ALPHAR  -   474C 0
ALPHA1  -    475C 0   PWGT    -    476C 0  DTIME1  -    477C 0  DTIME2  -    500C 0  MSWP    -    501C 0  MCOUNT  -   502C 0
MSLCT   -    503C 0   LGLTIJ  -    506C 0  XXX     -    535C 0  DAYT    -    574C 0  KDATT   -    575C 0  IBT     -   576C 0
PT      -    577C 0   KT      -   1754C 0  UT      -   1755C 0  VT      -   3132C 0  WT      -   4307C 0  ST      -  5464C 0
TT      -   6641C 0   PPT     -  10016C 0  RES     -  11173C 0  UTM     -  12350C 0  VTM     -  13525C 0  DAYB    -     0C 1
KDATB   -      1C 1   IMAXT   -      2C 1  NIB     -      3C 1  NIBT    -      4C 1  IUNDF   -      5C 1  RUNDF   -     6C 1
FLAT1   -      7C 1   FLAT2   -     10C 1  FLONG1  -     11C 1  FLONG2  -     12C 1  SO      -     13C 1  TO      -    14C 1
RUO     -     15C 1   ALPHA   -     16C 1  B       -     17C 1  HEATC   -     20C 1  PI      -     21C 1  RE      -    22C 1
S       -     23C 1   VISY    -     24C 1  SVISY   -     25C 1  TVISY   -     26C 1  VISZ    -     27C 1  SVISZ   -    30C 1
TVISZ   -     31C 1   POWER   -     32C 1  TAREA   -     33C 1  UAREA   -     34C 1  TVOL    -     35C 1  UVOL    -    36C 1
TKK     -     37C 1   CSTQ    -     40C 1  CSTE    -     41C 1  SECDAY  -     42C 1  DXT     -     43C 1  DXU     -    76C 1
RDXU2   -    131C 1   DYT     -    154C 1  DYU     -    165C 1  RDYU2   -    166C 1  EPSSK   -    167C 1  EPSTK   -   201C 1
RDCRIT  -    213C 1   DZ      -    225C 1  DZMH    -    237C 1  Z       -    251C 1  DEPTH   -    263C 1  BETA    -   264C 1
F       -    217C 1   DS      -    352C 1  AYZT    -    364C 1  AUXY    -    376C 1  AXZT    -    431C 1  AXZU    -  1047C 1
AX      -   1465C 1   AY      -   2103C 1  AZ      -   2521C 1  CSX     -   3137C 1  CSY     -   3555C 1  CSZ     -  4173C 1
CTX     -   4205C 1   CTY     -   4623C 1  CTZ     -   5241C 1  VISX    -   5253C 1  SVISX   -   5306C 1  TVISX   -  5341C 1
IBI     -   5374C 1   IMX     -   5375C 1  IMEF1   -   5376C 1  IMEF2   -   5377C 1  JMX     -   5400C 1  JMEF1   -  5401C 1
JMEF2   -   5402C 1   LAN     -   5403C 1  ING     -   5405C 1  INDBL   -   5407C 1  INDBR   -   5442C 1  LSBY    -  5475C 1
IEF1    -   5524C 1   IEF2    -   5557C 1  IND     -   5612C 1  AREAT   -   6767C 1  AREAU   -   6770C 1  VOLT    -  6771C 1
VOLU    -   6772C 1   AREATB  -   6773C 1  AREAUB  -   6774C 1  VOLTB   -   6775C 1  VOLUB   -   6776C 1  ATXY    -  6777C 1
FPD     -  10154C 1   NTPOT   -   1052     LFE     -   1051

          SUBROUTINES CALLED
OUTPTC     EXIT       PRTOJK      INDTABL     STABOUT     QBQRSD

          COMMON BLOCKS AND LENGTHS
CMN1    -  14702      CMN2    -  11331
     COMPILE TIME =      253       MILLISECS
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
1161                 0            SUBROUTINE INDTABL (KDAT,I2,J2,IB,LSBY,IEF1,IEF2,IMEF1,IMEF2,JMEF1INDT.2
1162                 0           1,JMEF2,IND)                                                        INDT.3
1163                 0            DIMENSION IND(I2,J2),LSBY(I2),IEF1(J2),IEF2(J2)                    INDT.4
1164                 0            I1=J1=1                                                            INDT.5
1165                 2       78   FORMAT (3X,10HRANGE OF I,4X,9(1H*),3X,20(5H ----))                 INDT.6
1166                 2       81   FORMAT (/4X,I3,3H TO, I3,4X,6HFOR J=,I3,2X,20I5)                   INDT.7
1167                 2      176   FORMAT (1H1,    30X,*MAP OF GRID-POINTS AND DISTRIBUTION OF CORNER INDT.8
1168                 2           1POINTS FOR BLOCK*I3/31X,65(1H*),14X,*DATE --*A10//               INDT.9
1169                 2           2 3X,9HEFFECTIVE,5X,12HOVER-ALL (I),1X,20A5)                       INDT.10
1170                 2      177   FORMAT (21X,2HI=,5X,20I5)                                          INDT.11
1171                 2            II2=0                                                              INDT.12
1172                 2      600   II1=II2+1                                                          INDT.13
1173                 5            II2=II1+19                                                         INDT.14
1174                12            IF (II2 .GT. I2) II2=I2                                            INDT.15
1175                14            PRINT 176, IB,KDAT, (LSBY(I),I=II1,II2)                            INDT.16
1176                35            PRINT 78                                                           INDT.17
1177                42            J=J2+1                                                             INDT.18
1178                42      180   J=J-1                                                              INDT.19
1179                44            PRINT 81, IEF1(J),IEF2(J), J, (IND(I,J),I=II1,II2)                 INDT.20
1180                76            IF (J .NE. J1) GO TO 180                                           INDT.21
1181               100            PRINT 78                                                           INDT.22
1182               105            PRINT 177, (I,I=II1,II2)                                           INDT.23
1183               122            IF (II2 .NE. I2) GO TO 600                                         INDT.24
1184               124            PRINT 190, IMEF1,IMEF2, JMEF1,JMEF2                                INDT.25
1185               141      190   FORMAT (//                                                         INDT.26
1186               141           1 30X,42H WEST - EAST  DIRECTION,  EFFECTIVE I FROM,I3,3H TO,I3/   INDT.27
1187               141           1 30X,42HSOUTH - NORTH DIRECTION,  EFFECTIVE J FROM,I3,3H TO,I3/)  INDT.28
1188               141            RETURN                                                             INDT.29
1189               141            END                                                                INDT.30

        LENGTH OF ROUTINE    INDTABL      265

        VARIABLE ASSIGNMENTS
KDAT  -      0     I2     -      0     J2     -      0     IB     -      0     LSBY   -      0     IEF1   -      0
IEF2  -      0     IMEF1  -      0     IMEF2  -      0     JMEF1  -      0     JMEF2  -      0     IND    -      0
I1    -    155     J1     -    154     II2    -    153     II1    -    152     I      -    151     J      -    150

        SUBROUTINES CALLED
OUTPTC     Q8QRSD
   COMPILE TIME = .  42    MILLISECS
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CARD          APPROXIMATE
NUMBER      PROGRAM LOCATION
1190               0              SUBROUTINE CHGTAPE (L,LLX)                                        CTAP.2
1191               0      C   ****LLX = (1,2) = (STAGE ONLY IF MWT(L) .GE. NRT(L), STAGE ANYWAY)    CTAP.3
1192               0      C   ========== BEGINING OF DIMENSION CHANGE  ==========                   CTAP.4
1193               0              COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,CTAP.5
1194               0             1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)CTAP.6
1195               0             2,NAMX(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)CTAP.7
1196               0             3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  CTAP.8
1197               0             3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,CTAP.9
1198               0             3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANCTAP.10
1199               0             4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),CTAP.11
1200               0             4LGLTIJ(2,4,3),XXX(30)                                             CTAP.12
1201               0             4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, CTAP.13
1202               0             527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        CTAP.14
1203               0      C   *********** ENDING OF DIMENSION CHANGE  ****************              CTAP.15
1204               0              DIMENSION KTPR(8)
1205               0              DIMENSION LFP(2)                                                  CTAP.16
1206               0              DATA LFP/8H   FULL ,8HPARTIAL /                                   CTAP.17
1207               0              DATA (KTPR(I),I=1,7)/5H*TLIB,1H ,2HBN,4HBK=2,4HMS=1,2HNS,2HDT/
1208               0              DATA KTPR(8)/0/
1209               0              LLY=LLX
1210              14              GO TO (5,4) LLX                                                   CTAP.19
1211              30            4 IF (MWT(L) .GE. NRT(L)) LLX=1                                     CTAP.20
1212              32              GO TO 6                                                           CTAP.21
1213              36            5 IF (MWT(L) .LT. NRT(L)) RETURN                                    CTAP.22
1214              40            6 CONTINUE                                                          CTAP.23
1215              40              LTP=NTAP(L) $ IL=ITAP(L)                                          CTAP.24
1216              40              LAB=MTLAB(IL,L)
1217              40              PRINT 10,LFP(LLX),(NAMT(I,L),I=1,3),NTAP(L),IL,MTLAB(IL,L),LAB,   CTAP.29
1218              40             1NRT(L),MWT(L)                                                     CTAP.30
1219             111           10 FORMAT (//10X,*=====*A8,*FILLED TAPE OF *3A10,3X,*TAPE LOGICAL NO.CTAP.31
1220             111             1=*I2/ 5X,*REEL NO.=*I4,* (LABEL=*A8,1H=,A8,*)  NO. OF MAXIMUM GROUCTAP.32
1221             111             2P-RECORDS PER TAPE=*I6,*,  NO. OF GROUP-RECORDS WRITTEN=*I6/)     CTAP.33
1222             111              GO TO (11,12) LLY
1223             121           12 CONTINUE
1224             121              PRINT 15, LTP
1225             130           15 FORMAT (/10X,15H*********** TAPE,I2,* IS NO LONGER NEEDED FOR THIS
1226             130             1RUN.*/)
1227             130              RETURN
1228             130           11 ITAP(L)=ITAP(L)+1
1229             131              IL=ITAP(L)
1230             140              IF (IL .GT. NOTAP(L)) GO TO 100
1231             141              ENCODE (2,3,KTPR(2)) LTP
1232             150            3 FORMAT (I2)
1233             150              PRINT 80, IL,LTP,MTLAB(IL,L),KTPR
1234             170           80 FORMAT (/10X,*-----------BEGIN TO USE THE*,I4,*-TH REEL OF TAPE*I2,
1235             170             1* LABEL =*A8/ 20X,*TLIB TO BE ASSIGNED ----- *,7A8,I8/)
1236             170              CALL NEWVOL (LTP,MTLAB(IL,L),1,KTPR)
1237             202              MWT(L)=0
1238             202              RETURN                                                            CTAP.45
1239             204          100 PRINT 110, (NAMT(I,L),I=1,3)                                      CTAP.46
1240             221          110 FORMAT (//10X,10H**********,3A10,*  NEEDS MORE REEL--- JOB TERMINACTAP.47
1241             221             1TES ABNORMALLY------*/)                                           CTAP.48
1242             221              CALL EXIT                                                         CTAP.49
1243             222              END                                                               CTAP.50

      LENGTH OF ROUTINE    CHGTAPE       344
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          VARIABLE ASSIGNMENTS
L       -       0     LLX     -       0     KTPR    -       0     LFP     -      10     DAYS    -      0C 0   KDAT    -      1C 0
DIFDAY  -      2C 0   DTIME   -      3C 0   DAYEND  -      4C 0   MAX1    -      5C 0   IMAX    -      6C 0   JMAX    -      7C 0
KMAX    -     10C 0   IM1     -     11C 0   JM1     -     12C 0   IP1     -     13C 0   JP1     -     14C 0   I1      -     15C 0
J1      -     16C 0   I2      -     17C 0   J2      -     20C 0   I       -     21C 0   J       -     22C 0   K       -     23C 0
NCARD1  -     24C 0   NCARD   -     25C 0   KSYB    -     26C 0   INKD    -     27C 0   INDEX   -     30C 0   IFIL    -     31C 0
NAMX    -     41C 0   NTPD1   -     44C 0   NTPD2   -     45C 0   NAMT    -     46C 0   NTAP    -     62C 0   NRT     -     66C 0
KNR     -     72C 0   MWT     -     76C 0   LDW     -    102C 0   LSTP    -    106C 0   BG      -    112C 0   DOUT    -    116C 0
NUTAP   -    122C 0   ITAP    -    126C 0   MTLAB   -    132C 0   PRTDAY  -    442C 0   LDWP    -    443C 0   LPSTP   -    444C 0
LSTDA   -    445C 0   IDMDA   -    446C 0   IDMDB   -    447C 0   IDMDC   -    450C 0   IDMDD   -    451C 0   NDIM    -    452C 0
NDIM1   -    453C 0   NDIM2   -    454C 0   NDSK1   -    455C 0   NDSK2   -    456C 0   NDSK3   -    457C 0   NDSK4   -    460C 0
NDSK5   -    461C 0   NDSK6   -    462C 0   NDSK7   -    463C 0   NDSK8   -    464C 0   MSUN    -    465C 0   MSJI    -    466C 0
LMIN1   -    467C 0   LMIN2   -    470C 0   IBSCAN  -    471C 0   MSCAN   -    472C 0   EPSL    -    473C 0   ALPHAR  -    474C 0
ALPHA1  -    475C 0   PWGT    -    476C 0   DTIME1  -    477C 0   DTIME2  -    500C 0   MSWP    -    501C 0   MCOUNT  -    502C 0
KSLCT   -    503C 0   LGLTIJ  -    506C 0   XXX     -    535C 0   DAYT    -    574C 0   KDATT   -    575C 0   IBT     -    576C 0
PI      -    577C 0   KT      -   1754C 0   JT      -   1755C 0   VT      -   3132C 0   WT      -   4307C 0   ST      -   5464C 0
TT      -   6641C 0   PPT     -  10016C 0   RES     -  11173C 0   UTM     -  12350C 0   VTM     -  13525C 0   LLY     -     232
LTP     -     231     IL      -     230     LAB     -     227

        SUBROUTINES CALLED
OUTPTC    OUTPTS    NEWVOL    EXIT      Q8QRSD

          COMMON BLOCKS AND LENGTHS  .
CMN1    -  14702
     COMPILE TIME =       79    MILLISECS
```

```
CARD                APPROXIMATE
NUMBER            PROGRAM LOCATION
1244                    0          SUBROUTINE GTABOUT (NAMX,NTPX,KDAT,IMAX,JMAX,DAYS,IB,K,LFE,LSBY,X)GTAB.2
1245                    0     C *** LFE = (0,1,2) = TABLE VALUES PRINTED IN FORMAT NOT CHANGED,        GTAB.3
1246                    0     C                      F-FORMAT, E-FORMAT)                                GTAB.4
1247                    0     C    ********** RETURN VALUE OF LFE=0 ALWAYS **********                  GTAB.5
1248                    0          DIMENSION X(IMAX,JMAX),LSBY(IMAX)                                    GTAB.6
1249                    0          DIMENSION NAMX(3), KFMT(3),LIN(13)
1250                    0          DATA MX,MYTOP,MYINC/ 0, 1010, 16/
1251                    0          DATA KFMT(1),KFMT(2)/10H(2X,2HJ=, ,10HI2,2X,    /                    GTAB.8
1252                    0      10  FORMAT (    8X,8HDATE -- ,A10,12X,11HLISTING OF ,3A10,F10.3,         GTAB.9
1253                    0         118H DAYS ---FOR BLOCK,I3,9H,   LEVEL,I3,3H---)                        GTAB.10
1254                    0      15  FORMAT (-12H OVERALL I= ,A6,11(4X,A6))                               GTAB.11
1255                    0      11  FORMAT (8H  BLK I=,12(5H  ===,I2,3H===))                              GTAB.12
1256                   26          IF (LFE .EQ. 0) GO TO 3                                              GTAB.13
1257                   30          GO TO (1,2) LFE                                                      GTAB.14
1258                   40       1  KFMT(3)=8H12F10.4)                                                   GTAB.15
1259                   40          LFE=0                                                                GTAB.16
1260                   40          GO TO 3                                                              GTAB.17
1261                   42       2  KFMT(3)=8H12E10.3)                                                   GTAB.18
1262                   43          LFE=0                                                                GTAB.19
1263                   43       3  CONTINUE                                                             GTAB.20
1264                   45          MY = MYTOP
1265                   45          ENCODE(125,10,LIN)KDAT,NAMX,DAYS,IB,K
1266                   66          CALL PWRT(MX,MY, LIN,125,0,0)
1267                   76          MY = MY - MYINC
1268                   76          I2=0                                                                 GTAB.22
1269                   76       5  I1=I2+1                                                              GTAB.23
1270                  101          I2=I2+12                                                             GTAB.24
1271                  106          IF (I2 .GT. IMAX) I2=IMAX                                            GTAB.25
1272                  110          ENCODE(128,15,LIN)(LSBY(I),I=I1,I2)
1273                  125          MY = MY - MYINC
1274                  125          CALL PWRT(MX,MY,LIN,128,0,0)
1275                  136          MY = MY - MYINC
1276                  136          J=JMAX+1                                                             GTAB.27
1277                  136          DO 40 JJ=1,JMAX                                                      GTAB.28
1278                  136          J=J-1                                                                GTAB.29
1279                  136          ENCODE(128,KFMT,LIN)J,( X(I,J),I=I1,I2 )
1280                  166          CALL PWRT(MX,MY,LIN,128,0,0)
1281                  176          MY = MY - MYINC
1282                  176      40  CONTINUE                                                             GTAB.31
1283                  202          ENCODE(128, 11 ,LIN)(I,I=I1,I2)
1284                  217          CALL PWRT(MX,MY,LIN,128,0,0)
1285                  227          MY = MY - MYINC
1286                  232          IF (I2 .NE. IMAX) GO TO 5                                            GTAB.33
1287                  234          CALL FRAME
1288                  235          RETURN                                                               GTAB.34
1289                  235          END                                                                  GTAB.35

       LENGTH OF ROUTINE    GTABOUT      331

       VARIABLE ASSIGNMENTS
NAMX   -      0   NTPX   -      0   KDAT   -      0   IMAX   -      0   JMAX   -      0   DAYS   -      0
IB     -      0   K      -      0   LFE    -      0   LSBY   -      0   X      -      0   KFMT   -      0
LIN    -      3   MX     -     20   MYTOP  -     21   MYINC  -     22   MY     -    251   I2     -    250
I1     -    247   I      -    246   J      -    245   JJ     -    244

       SUBROUTINES CALLED
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OUTPTS    PART      FRAME     2BORSD
    COMPILE TIME =     57    MILLISECS
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
1290                0         SUBROUTINE LSTOUT (NAMX,NTPX,KDAT,IMAX,JMAX,LSBY,LFE,DAYX,IB,K,U,VLSTA.2
1291                0        1,W,S,T)                                                            LSTA.3
1292                0         DIMENSION LSBY(IMAX),U(IMAX,JMAX),V(IMAX,JMAX),W(IMAX,JMAX),S(IMAXLSTA.4
1293                0        1,JMAX),T(IMAX,JMAX),NAMX(3)                                        LSTA.5
1294                0         NAMX(1)=10H U(I,J)                                                 LSTA.6
1295                2         LFE=1
1296                2         CALL STABOUT (NAMX,NTPX,KDAT,IMAX,JMAX,DAYX,IB,K,LFE,LSBY,U)       LSTA.7
1297               21         NAMX(1)=10H V(I,J)                                                 LSTA.8
1298               21         CALL STABOUT (NAMX,NTPX,KDAT,IMAX,JMAX,DAYX,IB,K,LFE,LSBY,V)       LSTA.9
1299               37         NAMX(1)=10H W(I,J)                                                 LSTA.10
1300               37         LFE=2
1301               37         CALL STABOUT (NAMX,NTPX,KDAT,IMAX,JMAX,DAYX,IB,K,LFE,LSBY,W)       LSTA.11
1302               56         NAMX(1)=10H S(I,J)                                                 LSTA.12
1303               56         LFE=1
1304               56         CALL STABOUT (NAMX,NTPX,KDAT,IMAX,JMAX,DAYX,IB,K,LFE,LSBY,S)       LSTA.13
1305               75         NAMX(1)=10H T(I,J)                                                 LSTA.14
1306               75         CALL STABOUT (NAMX,NTPX,KDAT,IMAX,JMAX,DAYX,IB,K,LFE,LSBY,T)       LSTA.15
1307              113         RETURN                                                             LSTA.16
1308              113         END                                                                LSTA.17

        LENGTH OF ROUTINE   LSTOUT        227

        VARIABLE ASSIGNMENTS
NAMX  -     0   NTPX  -    0   KDAT  -    0   IMAX  -    0   JMAX  -    0   LSBY  -    0
LFE   -     0   DAYX  -    0   IB    -    0   K     -    0   U     -    0   V     -    0
W     -     0   S     -    0   T     -    0

        SUBROUTINES CALLED
STABOUT   OBIRSD
     COMPILE TIME =     24    MILLISECS
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```
CARD              APPROXIMATE
NUMBER         PROGRAM LOCATION
1309                  0               SUBROUTINE PRTENGX (NTPO,KDAT,ITEM,NJMAX, NJ,XXP)                   PENG.2
1310                  0     C          *********** PRINT TABLE OF INPUT DATA XXP(I,J) ***************      PENG.3
1311                  0     C         WHERE I=1,ITEM, J=1,NJ  (BUT THE MAXIMUM VALUE OF J IS NJMAX)       PENG.4
1312                  0     C           ----- I.E. DIMENSION XXP(ITEM,NJMAX) -------------                PENG.5
1313                  0     C          SUCH THAT -- (YYP(I,JJ),I=1,ITEM),JJ=1,NCOL)                       PENG.6
1314                  0     C          WHER YYP(I,JJ)=XXP(I,JX) AND JX=(JJ-1)*LIN+JJ                      PENG.7
1315                  0     C          WHERE YYP(I,JJ)=XXP(I,JX) AND JX=(JJ-1)*LIN+JJ                     PENG.8
1316                  0     C          AND (LIN=1,NLIN) IS THE LINE SEQUENSE NO.                          PENG.9
1317                  0     C          NLIN=MAXIMUM LINES ALLOWED TO BE PRINTED ON ONE PAGE.              PENG.10
1318                  0     C          (THEREFORE NLIN SHOULD BE PRE-SETTED, SEE DATA STATEMENT)          PENG.11
1319                  0     C         NTPO=LOGICAL NO. OF THIS OUTPUT FILE TAPE.                          PENG.12
1320                  0     C          KDAT = DATE OF PROGRAM RUN.                                        PENG.13
1321                  0               DIMENSION XXP(ITEM,NJMAX)                                           PENG.14
1322                  0               DIMENSION YYP(12)                                                   PENG.15
1323                  0     C  ***************REAL KDAT,  FOR NCAR ONLY******************                 PENG.16
1324                  0               DATA NLIN,NCOL/50,2/                                                PENG.17
1325                  0          30   FORMAT (1H1/25X,*OVER ALL  -- ENERGY --  TABLE AS A FUNCTION OF TIPENG.18
1326                  0              1ME SEQUENCE*/25X,60(1H*)/                                           PENG.19
1327                  0              192X,*DATE OF PROGRAM RUN --- *A10/                                  PENG.20
1328                  0              14X,62(1H=),3X,62(1H=)/                                              PENG.21
1329                  0              21X, 2(65H   SEQUENCE      OVER ALL KINETIC ENERGY        OVER ALL   PENG.22
1330                  0              2 TOTAL  )/                                                          PENG.23
1331                  0              31X, 2(65H      IN      -----------------------------    POTENTIAL   PENG.24
1332                  0              2 ENERGY )/                                                          PENG.25
1333                  0              41X, 2(65H     DAYS     VT. MEAN  DEVIATED    TOTAL       ENERGY     PENG.26
1334                  0              2(KE+PE) )/                                                          PENG.27
1335                  0              51X, 2(65H   =========  ========  ========  ========    ========    PENG.28
1336                  0              2========))                                                          PENG.29
1337                  0          20   FORMAT (1X,2(F12.3,3E10.3,   E12.4,E11.3))                          PENG.30
1338                  0          31   FORMAT (4X,62(1H*),3X,62(1H*))                                      PENG.31
1339                 21               IF (NJ .EQ. 0) GO TO 81                                             PENG.32
1340                 23               IJMAX=NCOL*ITEM                                                     PENG.33
1341                 23               NK=NJ/NCOL                                                          PENG.34
1342                 30               IF (NJ .NE. NK*NCOL) NK=NK+1                                        PENG.35
1343                 33               WRITE (NTPO,30) KDAT                                                PENG.36
1344                 43               K=0                                                                 PENG.37
1345                 43          10   K=K+1                                                               PENG.38
1346                 44               IJ=0                                                                PENG.39
1347                 44               J=K-NK                                                              PENG.40
1348                 44          13   J=J+NK                                                              PENG.41
1349                 53               IF (J .GT. NJ) GO TO 16                                             PENG.42
1350                 55          14   I=0                                                                 PENG.43
1351                 55          15   I=I+1                                                               PENG.44
1352                 56               IJ=IJ+1                                                             PENG.45
1353                 56               YYP(IJ)=XXP(I,J)                                                    PENG.46
1354                 66               IF (I .NE. ITEM) GO TO 15                                           PENG.47
1355                 70               IF (IJ .NE. IJMAX) GO TO 13                                         PENG.48
1356                 73          16   IF (IJ .EQ. 0) GO TO 17                                             PENG.49
1357                 75               WRITE (NTPO,20) (YYP(I),I=1,IJ)                                     PENG.50
1358                113               IF (K .NE. NK) GO TO 10                                             PENG.51
1359                115          17   WRITE (NTPO,31)                                                     PENG.52
1360                123          81   CONTINUE                                                            PENG.53
1361                123               RETURN                                                              PENG.54
1362                123               END                                                                 PENG.55

        LENGTH OF ROUTINE    PRTENGX       301
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```
          VARIABLE ASSIGNMENTS
NTPD   -      0    KDAT   -      0    ITEM   -      0    NJMAX  -      0    NJ     -      0    XXP    -      0
YYP    -      0    NLIN   -     14    NCOL   -     15    IJMAX  -    137    NK     -    136    K      -    135
IJ     -    134    J      -    133    I      -    132

          SUBROUTINES CALLED
OUTPTC    QBQRSD
     COMPILE TIME =     46    MILLISECS
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
1363                  0              SUBROUTINE DATPLT (ITEM)                                                DAPL.2
1364                  0              COMMON/CPL/NAM(3,6),IUNI(6),ISG(6),MASKA(10),NWD,NSCAL,JDAS,IDOT   DAPL.3
1365                  0              DATA NWD,JDAS,IDOT/12,20,3/                                             DAPL.4
1366                  0              DATA ISG/1H ,1HM,1HD,1HK,1HP,1HT/                                       DAPL.5
1367                  0      C       JDAS = FOR  EVERY JDAS VERTICAL DATA DRAW A HORIZONTAL GRID-LINE.  DAPL.6
1368                  0      C       DAS .LE. 0 FOR THE CASE OF ELIMINATING SUCH HORIZONTAL GRID-LINE.  DAPL.7
1369                  0      C       IDOT = FOR EVERY IDOT*10 HORIZONTAL UNIT SCALE DRAW A VERTICAL     DAPL.8
1370                  0      C            DOT LINE, IDOT=0 VERTICAL DOT-LINE NOT WANTED.                 DAPL.9
1371                  0              DATA (NAM(I),I= 1, 9)/90HDAYS                          VERTICAL MDAPL.10
1372                  0             1EAM-HORIZONTAL K.E. DEVIATED-HORIZONTAL K.E.      /                 DAPL.11
1373                  0              DATA (NAM(I),I=10,18)/90H TOTAL KINETIC ENERGY          POTENTIAL-DAPL.12
1374                  0             1ENERGY              TOTAL ENERGY (K.E.+P.E.)      /                 DAPL.13
1375                  0              DATA IUNI/50H DAYS        ERGS       ERGS       ERGS       ERGS      ERDAPL.14
1376                  0             1GS       /                                                          DAPL.15
1377                  4              IF (JDAS .LE. 0) JDAS=9999999999                                    DAPL.16
1378                 10              IF (IDOT .EQ. 0) IDOT=9999999999                                    DAPL.17
1379                 13              NSCAL=NWD*10-1                                                      DAPL.18
1380                 13              DO 20 J=1,ITEM                                                      DAPL.19
1381                 13              DO 10 I=1,10                                                        DAPL.20
1382                 16         10   MASKA(I)=ISG(J)                                                     DAPL.21
1383                 25              ENCODE (10,11,ISG(J)) (MASKA(I),I=1,10)                             DAPL.22
1384                 43         11   FORMAT (10A1)                                                       DAPL.23
1385                 43         20   CONTINUE                                                            DAPL.24
1386                 43      C       I=10            *********ORIGINAL, FROM HERE BELOW******            DAPL.25
1387                 43      C       MASKA(1)=77777777777777777700B                                      DAPL.26
1388                 43      C 15    I=I-1                                                               DAPL.27
1389                 43      C       IWD=MASKA(I+1)                                                      DAPL.28
1390                 43      C       MASKA(I)=SHIFT(IWD,6)                                               DAPL.29
1391                 43      C       IF (I .NE. 1) GO TO 15            ******FROM HERE ABOVE*******      DAPL.30
1392                 43      C      ********************NCAR VERSION*********************************** DAPL.31
1393                 45              MASKA(1)=00777777777777777777B $ MASKA(2)=77007777777777777777B   DAPL.32
1394                 45              MASKA(3)=77770077777777777777B $ MASKA(4)=77777700777777777777B   DAPL.33
1395                 45              MASKA(5)=77777777007777777777B $ MASKA(6)=77777777770077777777B   DAPL.34
1396                 45              MASKA(7)=77777777777700777777B $ MASKA(8)=77777777777777007777B   DAPL.35
1397                 45              MASKA(9)=77777777777777770077B $ MASKA(10)=77777777777777777700B  DAPL.36
1398                 45      C      **********************NCAR DOES NOT HAVE SHIFTT ROUTINE*********     DAPL.37
1399                 45              RETURN                                                              DAPL.38
1400                 52              END                                                                 DAPL.39

          LENGTH OF ROUTINE   DATPLT        110

          VARIABLE ASSIGNMENTS
ITEM    -       0    NAM    -      0C 0  IUNI    -     22C 0  ISG     -     30C 0  MASKA  -     36C 0  NWD     -     50C 0
NSCAL   -     51C 0  JDAS   -    52C 0  IDOT    -     53C 0  J       -     71     I      -     70

          SUBROUTINES CALLED
OUTPTS     Q8QRSD

          COMMON BLOCKS AND LENGTHS
CPL    -      64
     COMPILE TIME =      35    MILLISECS
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```
 APPROXIMATE
PROGRAM LOCATION
      0          SUBROUTINE MPLOT (NTPD,KDAT,ITEM,NJMAX,NJ,XXP,XMIN,XMAX,IR,NPLX,   PLOT.2
      0         1 IPL,FAC,KFASW)                                                     PLOT.3
      0     C    **********MULTIPLE-LINE PLOT*********                               PLOT.4
      0     C    NJ=TOTAL NO. OF POINTS TO BE PLOTTED FOR EACH LINE.                 PLOT.5
      0     C         (I.E. TOTAL OF OF J VALUES OF XXP(I,J) FOR EACH I )            PLOT.6
      0     C    XMIN=MINIMUM VALUE OF THE DATA XXP(I,J) TO BE PLOTTED.              PLOT.7
      0     C    XMAX=MAXIMUM VALUE OF THE DATA XXP(I,J) TO BE PLOTTED.              PLOT.8
      0     C** XMAX .GE. XMIN FOR NORMAL CASE (I.E. PLOT NPLX CURVES ON SAME PAGE   PLOT.9
      0     C                AND XMAX, XMIN ARE THE KNOWN MAXIMUM AND MINIMUM VALUES. PLOT.10
      0     C** XMAX .LT. XMIN AND XMAX .GT. 0 AND XMIN .GT. 0, FOR THE CASE OF      PLOT.11
      0     C    PLOTTING NPLX CURVES (WITH MAXIMUM AND MINIMUM VALUES UN-KNOWN) ON PLOT.12
      0     C    SAME PAGE.                                                          PLOT.13
      0     C** XMAX .LT. XMIN AND XMAX .LT. 0 AND XMIN .LT. 0, FOR THE CASE OF      PLOT.14
      0     C    PLOTTING NPLX CURVES (WITH MAXIMUM AND MINIMUM VALUES UN-KNOWN) ON PLOT.15
      0     C    NPLX PAGES. (I.E. ONE CURVE PER PLOT)                               PLOT.16
      0     C    IR IS DEFINED SUCH THAT XXP(IR,J) FOR ALL J ARE PRINTED ON Y-AXISPLOT.17
      0     C    XXP(I,J) (WHERE I .NE. IR AND I BELONGS TO IPL(II) FOR SOME II)     PLOT.18
      0     C     ARE PRINTED ON X-AXIS.                                             PLOT.19
      0     C    NPL=NO. OF LINES TO BE PLOTTED. (I.E. NO. OF I#S OF XXP(I,J))       PLOT.20
      0     C    IPL(K)=I, THE K-TH LINE TO BE PLOTTED IS THE I-TH ITEM.             PLOT.21
      0     C ---(FAC(I),I=1,ITEM) CONSTANT FACTOR WHICH XXP(I,J)=XXP(I,J)/FAC(I)    PLOT.22
      0     C    FOR PLOT.                                                           PLOT.23
      0     C  ------KFASW=0, DO NOT CALCULATE XXP(I,J)/FAC(I), SINCE IT IS DONE     PLOT.24
      0     C                 BEFORE CALL THIS SUBROUTINE.                           PLOT.25
      0     C -----KFASW=1, CALCULATE XXP(I,J)=XXP(I,J)/FAC(I) IN SUBROUTINE MPLOT  PLOT.26
      0     C -------CALL SUBROUTINE DATPLT BEFORE THE 1ST CALL OF THIS SUBROUTINE  PLOT.27
      0     C    SET THE PLOTTING DATA IN SUBROUTINE DATPLT.                         PLOT.28
      0          COMMON/CPL/NAM(3,6),IUNI(6),ISG(6),MASKA(10),NWD,NSCAL,JOAS,IDOT    PLOT.29
      0          DIMENSION XXP(ITEM,NJMAX),IPL(ITEM),FAC(ITEM)                       PLOT.30
      0          DIMENSION IA(13),TIL(20)                                            PLOT.31
     44          IF (KFASW .EQ. 0) GO TO 71                                          PLOT.32
     46          II=NFAC=0                                                           PLOT.33
     46       60 II=II+1                                                             PLOT.34
     53          IF(II .GT. NPLX) GO TO 70                                           PLOT.35
     55          I=IPL(II)                                                           PLOT.36
     61          IF (FAC(I) .NE. 0.0) GO TO 61                                       PLOT.37
     63          FAC(I)=1.0                                                          PLOT.38
     63          GO TO 60                                                            PLOT.39
     71       61 IF (FAC(I) .EQ. 1.0) GO TO 60                                       PLOT.40
     72          NFAC=NFAC+1                                                         PLOT.41
     72          J=0                                                                 PLOT.42
     72       62 J=J+1                                                               PLOT.43
    100          IF (J .GT. NJ) GO TO 60                                             PLOT.44
    102          XXP(I,J)=XXP(I,J)/FAC(I)                                            PLOT.45
    102          GO TO 62                                                            PLOT.46
    111       70 IF (NFAC .EQ. 0) GO TO 71                                           PLOT.47
    115          IF (XMAX .LT. XMIN) GO TO 71                                        PLOT.48
    117          XMIN=2.0 $ XMAX=1.0                                                 PLOT.49
    117       71 CONTINUE                                                            PLOT.50
    122          UNIT=XMAX-XMIN                                                      PLOT.51
    126          IF (UNIT .GE. 0.0) GO TO 2                                          PLOT.52
    131          IF (XMIN .LT. 0.0) GO TO 1                                          PLOT.53
    133          NPL=NPLX                                                            PLOT.54
    133          JCHK=1                                                             *PLOT.55
    133          GO TO 21                                                            PLOT.56
    135        1 NPL=0                                                               PLOT.57
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CARD            APPROXIMATE
NUMBER .       PROGRAM LOCATION
1457              135           JCHK=-1                                                                  PLOT.58
1458              136           GO TO 21                                                                 PLOT.59
1459              140        2  NPL=NPLX                                                                 PLOT.60
1460              141           III=1                                                                    PLOT.61
1461              141           JCHK=0                                                                   PLOT.62
1462              141           GO TO 29                                                                 PLOT.63
1463              145       21  III=0                                                                    PLOT.64
1464              145       22  XMIN=1.0E50 $ XMAX=-1.0E50                                               PLOT.65
1465              146       23  III=III+1                                                                PLOT.66
1466              150           I=IPL(III)                                                               PLOT.67
1467              155           IF (NPL .NE. NPLX) NPL=III                                               PLOT.68
1468              160           J=0                                                                      PLOT.69
1469              160       24  J=J+1                                                                    PLOT.70
1470              170           IF (XXP(I,J) .LT. XMIN) XMIN=XXP(I,J)                                    PLOT.71
1471              203           IF (XXP(I,J) .GT. XMAX) XMAX=XXP(I,J)                                    PLOT.72
1472              211           IF (J .NE. NJ) GO TO 24                                                  PLOT.73
1473              214           IF (III .NE. NPL) GO TO 23                                               PLOT.74
1474              220           IF (JCHK .GT. 0) III=1                                                   PLOT.75
1475              222           UNIT=XMAX-XMIN                                                           PLOT.76
1476              225       29  IF (UNIT .NE. 0.0) GO TO 7773                                            PLOT.77
1477              227           XMAX=XMIN+1.0                                                            PLOT.78
1478              227           UNIT=1.0                                                                 PLOT.79
1479              227     7773  UNIT=UNIT/FLOAT(NSCAL)                                                   PLOT.80
1480              232           TUNO=10.0*UNIT                                                           PLOT.81
1481              232           I=1                                                                      PLOT.82
1482              236           TIL(I)=XMIN+5.0*UNIT                                                     PLOT.83
1483              236        4  I=I+1                                                                    PLOT.84
1484              243           TIL(I)=TIL(I-1)+TUNO                                                     PLOT.85
1485              250           IF (I .NE. NWD) GO TO 4                                                  PLOT.86
1486              251           NSCA=NSCAL+1                                                             PLOT.87
1487              251           NWD1=NWD                                                                 PLOT.88
1488              251           WRITE (NTPO,40) XXP(IR,1),XXP(IR,NJ),KDAT                                PLOT.89
1489              274       40  FORMAT (1H1,26X,*OVER ALL ENERGY PLOT FROM*F10.3,* DAYS TO*F10.3,        PLOT.90
1490              274          1* DAYS*/27X,58(1H*),10X,*DATE OF PROGRAM RUN --*A10/)                    PLOT.91
1491              274           II=III-1                                                                 PLOT.92
1492              275        5  II=II+1                                                                  PLOT.93
1493              302           IF (II .GT. NPL) GO TO 9                                                 PLOT.94
1494              303           I=IPL(II)                                                                PLOT.95
1495              305           WRITE (NTPO,41) ISG(I),(NAM(L,I),L=1,3), FAC(I),IUNI(I)                  PLOT.96
1496              334       41  FORMAT (25X,1H(,A1,3H)  ,3A10.*-- IN UNIT OF -- *E16.8,1X,A10)           PLOT.97
1497              334           GO TO 5                                                                  PLOT.98
1498              334        9  WRITE (NTPO,43) XMIN, XMAX                                               PLOT.99
1499              347       43  FORMAT (/27X,* MINIMUM SCALE =*E16.8,4X,*MAXIMUM SCALE =*E16.8/)         PLOT.100
1500              347           WRITE (NTPO,42) NAM(1,IR), (TIL(I),I=1,NWD)                              PLOT.101
1501              367       42  FORMAT (3X,A5,12E10.3/10H =========*,12(10H****I*****),1H*)              PLOT.102
1502              367           JEVEN=0                                                                  PLOT.103
1503              371           J=1 $ IAI=55555555555555555555B                                          PLOT.104
1504              371           GO TO 14                                                                 PLOT.105
1505              373       13  J=J+1                                                                    PLOT.106
1506              402           IF (MOD(J,JDAS) .NE. 0 .OR. J .EQ. NJ) GO TO 12                          PLOT.107
1507              404           IAI=46554655465546554655B                                                PLOT.108
1508              404           GO TO 14                                                                 PLOT.109
1509              405       12  IAI=55555555555555555555B                                                PLOT.110
1510              405       14  DO 10 I=1,NWD1                                                           PLOT.111
1511              406           IF (MOD(I,IDOT) .EQ. 0) GO TO 18                                         PLOT.112
1512              406           IAJ=IAI                                                                  PLOT.113
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
1513              405            GO TO 19                                                         PLOT.114
1514              406       18   IAJ=IAI .AND. 77777777770077777777B .OR. 00000000005700000000B    PLOT.115
1515              406       19   IA(I)=IAJ                                                        PLOT.116
1516              406       10   CONTINUE                                                         PLOT.117
1517              431            II=III-1                                                         PLOT.118
1518              432       20   II=II+1                                                          PLOT.119
1519              434            I=IPL(II)                                                        PLOT.120
1520              435            JND=(XXP(I,J)-XMIN)/UNIT                                         PLOT.121
1521              436            L=UND+1.5                                                        PLOT.122
1522              451            IF (L .GT. NSCA) L=NSCA                                          PLOT.123
1523              453            WD=FLOAT(L)/10.0                                                 PLOT.124
1524              453            IWRD=WD                                                          PLOT.125
1525              453            JCHT=L-IWRD*10                                                   PLOT.126
1526              460            IF (JCHT .NE. 0) GO TO 15                                        PLOT.127
1527              462            JCHT=10                                                          PLOT.128
1528              462            GO TO 17                                                         PLOT.129
1529              463       15   IWRD=IWRD+1                                                      PLOT.130
1530              464       17   MASKD=.NOT. MASKA(JCHT) .AND. ISG(I)                             PLOT.131
1531              465            IA(IWRD)=IA(IWRD) .AND. MASKA(JCHT)                              PLOT.132
1532              465            IA(IWRD)=IA(IWRD) .OR. MASKD                                     PLOT.133
1533              476            IF (II .NE. NPL) GO TO 20                                        PLOT.134
1534              503            IF (J .EQ. NJ .OR. JEVEN .EQ. 0) GO TO 51                        PLOT.135
1535              505            WRITE (NTPD,52) (IA(I),I=1,NWD1)                                 PLOT.136
1536              522       52   FORMAT (9X,1H*,12A10,1H*)                                        PLOT.137
1537              522            JEVEN=0                                                          PLOT.138
1538              522            GO TO 30                                                         PLOT.139
1539              523       51   WRITE (NTPD,50) XXP(IR,J),(IA(I),I=1,NWD1)                       PLOT.140
1540              546       50   FORMAT (    F9.2,1H*,12A10,1H*)                                  PLOT.141
1541              546            JEVEN=1                                                          PLOT.142
1542              550       30   IF (J .NE. NJ) GO TO 13                                          PLOT.143
1543              552            WRITE (NTPD,44) NAM(1,IR), (TIL(I),I=1,NWD)                      PLOT.144
1544              572       44   FORMAT (10H =========*,12(10H****I*****),1H*/ 3X,A5,12E10.3//)   PLOT.145
1545              572            II=III-1                                                         PLOT.146
1546              573       65   II=II+1                                                          PLOT.147
1547              600            IF (II .GT. NPL) GO TO 69                                        PLOT.148
1548              601            I=IPL(II)                                                        PLOT.149
1549              603            WRITE (NTPD,41) ISG(I),(NAM(L,I),L=1,3), FAC(I),IUNI(I)          PLOT.150
1550              632            GO TO 65                                                         PLOT.151
1551              632       69   WRITE (NTPD,43) XMIN, XMAX                                       PLOT.152
1552              645            WRITE (NTPD,45) KDAT                                             PLOT.153
1553              655       45   FORMAT (/40X,*=========PROGRAM RUN AT *A10,*=========*/)         PLOT.154
1554              656            IF (NPL .NE. NPLX) GO TO 22                                      PLOT.155
1555              660            RETURN                                                           PLOT.156
1556              660            END                                                              PLOT.157

        LENGTH OF ROUTINE   MPLOT        1133

        VARIABLE ASSIGNMENTS
NTPD   -      0     KDAT   -      0     ITEM   -      0     NJMAX  -      0     NJ     -      0     XXP    -      0
XMIN   -      0     XMAX   -      0     IR     -      0     NPLX   -      0     IPL    -      0     FAC    -      0
KFASK  -      0     IA     -      0     TIL    -     15     NAM    -     0C 0   IUNI   -    22C 0   ISG    -    30C 0
MASKA  -    35C 0   NWD    -    50C 0   NSCAL  -    51C 0   JDAS   -    52C 0   IDDT   -    53C 0   II     -    713
KFAC   -    712     I      -    711     J      -    710     UNIT   -    707     NPL    -    706     JCHK   -    705
III    -    704     TJND   -    703     NSCA   -    702     NWD1   -    701     L      -    700     JEVEN  -    677
IAI    -    676     IAJ    -    675     JND    -    674     WD     -    673     IWRD   -    672     JCHT   -    671
MASKD  -    670
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                SUBROUTINES CALLED
OUTPTC           QBQRSD

                COMMON BLOCKS AND LENGTHS
CPL      -        54
    COMPILE TIME =      209     MILLISECS
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CARD           APPROXIMATE
NUMBER       PROGRAM LOCATION
1557              0              SUBROUTINE PRTDJK (NAMX,JM,KM,X)                              PRJK.2
1558              0              DIMENSION NAMX(3),X(JM,KM)                                    PRJK.3
1559              0        20    FORMAT (/5X,3A10)                                             PRJK.4
1560              0        22    FORMAT (5X,A10,5(I5,1H),E16.8)/(15X,5(I5,1H),E16.8)))         PRJK.5
1561              0              PRINT 20, NAMX                                                PRJK.6
1562             11              K=1                                                           PRJK.7
1563             13              IF (KM .NE. 1) GO TO 10                                       PRJK.8
1564             15              LSK=10H                                                       PRJK.9
1565             15              GO TO 15                                                      PRJK.10
1566             17        10    ENCODE (10,12,LSK) K                                          PRJK.11
1567             26        12    FORMAT (3H(K=,I3,4H)    )                                     PRJK.12
1568             26        15    PRINT 22, LSK, (J,X(J,K),J=1,JM)                              PRJK.13
1569             51              IF (K .EQ. KM) GO TO 16                                       PRJK.14
1570             53              K=K+1                                                         PRJK.15
1571             54              GO TO 10                                                      PRJK.16
1572             55        16    RETURN                                                        PRJK.17
1573             55              END                                                           PRJK.18

        LENGTH OF ROUTINE   PRTDJK        114

        VARIABLE ASSIGNMENTS
NAMX   -      0    JM    -      0    KM    -      0    X    -     0    K              66    LSK    -    65
J      -     64

        SUBROUTINES CALLED
OUTPTC     OUTPTS     Q8QRSD
    COMPILE TIME =       20     MILLISECS
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APPROXIMATE
PROGRAM LOCATION
   0         SUBROUTINE COLDST (NDSKX,NDSKR)                                   COLD.2
   0     C   ========== BEGINING OF DIMENSION CHANGE  ==========              COLD.3
   0         COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,COLD.4
   0        1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)COLD.5
   0        2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)COLD.6
   0        3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  COLD.7
   0        3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,COLD.8
   0        3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANCOLD.9
   0        4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),COLD.10
   0        4LGLTIJ(2,4,3),XXX(30)                                             COLD.11
   0        4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, COLD.12
   0        527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        COLD.13
   0         DIMENSION XUVR(2484)                                              COLD.14
   0         EQUIVALENCE (PPT(1),XUVR(1))                                      COLD.15
   0         DIMENSION BT(624),DT(3106)                                        COLD.16
   0         EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                               COLD.17
   0         COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,    COLD.18
   0        1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   COLD.19
   0        2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTG,CSTE,SECDAY,COLD.20
   0        3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITCOLD.21
   0        4(10),DZ(10),DZ4H(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  COLD.22
   0        1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  COLD.23
   0        6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( COLD.24
   0        727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,  COLD.25
   0        8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( COLD.26
   0        923,27),AREAT,AREAJ,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)COLD.27
   0        1,EPD(23,27)
   0         DIMENSION X(2412),Y(2013)
   0         EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                COLD.30
   0         COMMON/CMN3/BP(624),DA(3106),DB(3106),DC(3106)                    COLD.31
   0         DIMENSION P(23,27)                                                COLD.32
   0         DIMENSION  U(23,27), V(23,27), W(23,27), S(23,27), T(23,27)       COLD.33
   0         EQUIVALENCE (DA(1),K(4)),(DA(2), U(1)),(DA(623), V(1)),(DA(1244), W(COLD.34
   0        11)),(DA(1865), S(1)),(DA(2486), T(1))                             COLD.35
   0         DIMENSION SOJK(27,10),TOJK(27,10)                                 COLD.36
   0     C   ********** ENDING OF DIMENSION CHANGE  ****************           COLD.37
   0         EQUIVALENCE (DB(1),SOJK(1)),(DC(1),TOJK(1))                       COLD.38
   0         DATA ZERO/-0.0/                                                   COLD.39
1166         CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKX) $ CALL REWDTP (NDSKR)   COLD.40
1171         PRINT 25, DAYS, ZERO, RUNDF, RUNDF                                COLD.41
1206     25  FORMAT (//10X,*---------- COLD START AT DAYS=*F12.3,10(1H-)/      COLD.42
1206        1/15X,*INITIAL VALUE OF P(I,J), U(I,J), V(I,J), W(I,J) =*E16.8,2X, COLD.43
1206        2*FOR ALL LEVEL AND ALL BLOCK*/25X, *INITIAL VALUE FOR POINT OUTSIDCOLD.44
1206        2E BOUNDARY = RUNDF =*E16.8,4H = (,O20,1H)//25X,*CARD-INPUT INITIALCOLD.45
1206        1 VALUES FOR  SOJK(J,K) AND TOJK(J,K) ARE*)                        COLD.46
1207         IF (NCARD .EQ. 0) NCARD=NCARD1                                    COLD.47
1212         IB=0 $ INKD=3 $ NAMX(2)=NAMX(3)=1H                                COLD.48
1212         KSYB=4HSOJK  $ NAMX(1)=10HSOJK(J,K)                               COLD.49
1212         CALL CRDINP (NCARD,KSYB,IB,INKD,JMAX,KMAX,SOJK)                   COLD.50
1232         CALL PRTOJK (NAMX,JMAX,KMAX,SOJK)                                 COLD.51
1240         KSYB=4HTOJK  $ NAMX(1)=10HTOJK(J,K)                               COLD.52
1240         CALL CRDINP (NCARD,KSYB,IB,INKD,JMAX,KMAX,TOJK)                   COLD.53
1254         CALL PRTOJK (NAMX,JMAX,KMAX,TOJK)                                 COLD.54
1262         I1=J1=1 $ I2=IMAX $ J2=JMAX                                       COLD.55
1262         DAYK=DAYS $ KDATX=KDAT                                            COLD.56
1262      1  CALL RDBUFL(NDSK5,IDMDB,Y)                                        COLD.57
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CARD           APPROXIMATE
NUMBER       PROGRAM LOCATION
1630             1276             IB=IBI                                                         COLD.58
1631             1276             LR=1                                                           COLD.59
1632             1276             CALL INDINTG (IMAX,JMAX,IND,INDBL,LR,ING)                      COLD.60
1633             1310             LR=2                                                           COLD.61
1634             1310             CALL INDINTG (IMAX,JMAX,IND,INDBR,LR,ING)                      COLD.62
1635             1321             DO 10 J=J1,J2                                                  COLD.63
1636             1321             DO 10 I=I1,I2                                                  COLD.64
1637             1322             INDEX=IND(I,J)                                                 COLD.65
1638             1322             IF (INDEX) 3,9,7                                               COLD.66
1639             1322          3  U(I,J)=V(I,J)=W(I,J)=P(I,J)=PPT(I,J)=RUNDF                     COLD.67
1640             1322             GO TO 10                                                       COLD.68
1641             1322          7  W(I,J)=P(I,J)=PPT(I,J)=ZERO                                    COLD.69
1642             1322             IF (INDEX .GT. 6) GO TO 8                                      COLD.70
1643             1322             U(I,J)=V(I,J)=ZERO                                             COLD.71
1644             1322             GO TO 10                                                       COLD.72
1645             1322          8  U(I,J)=V(I,J)=RUNDF                                            COLD.73
1646             1322             GO TO 10                                                       COLD.74
1647             1322          9  U(I,J)=V(I,J)=W(I,J)=P(I,J)=PPT(I,J)=ZERO                      COLD.75
1648             1322         10  CONTINUE                                                       COLD.76
1649             1360             CALL WTBUFL (NDSKR,IDMDC,XUVR)                                 COLD.77
1650             1366             CALL WTBUFL (NDSKX,NDIM1,BP)                                   COLD.78
1651             1373             CALL WTBUF (NTAP(2),NDIM1,BP)                                  COLD.79
1652             1400             DO 20 KA=1,KMAX                                                COLD.80
1653             1400             DO 15 J=J1,J2                                                  COLD.81
1654             1401             DO 15 I=I1,I2                                                  COLD.82
1655             1402             IF (IND(I,J) .NE. IUNDF) GO TO 12                              COLD.83
1656             1402             S(I,J)=T(I,J)=RUNDF                                            COLD.84
1657             1402             GO TO 15                                                       COLD.85
1658             1402       C  --------DEFINE INITIAL S(I,J) AND T(I,J) FOR K=KA AND BLOCK=IB-----  COLD.86
1659             1402         12  S(I,J)=SOJK(J,KA)                                              COLD.87
1660             1402             T(I,J)=TOJK(J,KA)                                              COLD.88
1661             1402         15  CONTINUE                                                       COLD.89
1662             1430             CALL WTBUFL (NDSKX,NDIM2,DA)                                   COLD.90
1663             1435             CALL WTBUF (NTAP(2),NDIM2,DA)                                  COLD.91
1664             1443         20  CONTINUE                                                       COLD.92
1665             1447             IF (IBI .NE. NIB) GO TO 1                                      COLD.93
1666             1451             RETURN                                                         COLD.94
1667             1451             END                                                            COLD.95

          LENGTH OF ROUTINE   COLDST      1536

          VARIABLE ASSIGNMENTS
NDSKX   -        0    NDSKR   -       0    XUVR    -  10016C 0  BT      -   574C 0  DT      -  1754C 0  X       -     0C 1
U       -   5374C 1   P       -       0    J       -   1161C 2  V       -  2336C 2  W       -  3513C 2  S       -  4670C 2
I       -   6045C 2   SOJK    -   7222C 2  TOJK    -  15264C 2  DAYS    -     0C 0  KDAT    -     1C 0  DIFDAY  -     2C 0
DTIME   -     3C 0    DAYEND  -     4C 0   MAXI    -      5C 0  IMAX    -     6C 0  JMAX    -     7C 0  KMAX    -    10C 0
IM1     -    11C 0    JM1     -    12C 0   IP1     -     13C 0  JP1     -    14C 0  I1      -    15C 0  J1      -    16C 0
I2      -    17C 0    J2      -    20C 0   I       -     21C 0  J       -    22C 0  K       -    23C 0  NCARD1  -    24C 0
NCARD   -    25C 0    KSYB    -    26C 0   INKD    -     27C 0  INDEX   -    30C 0  ITIL    -    31C 0  NAMX    -    41C 0
NTPD1   -    44C 0    NTPD2   -    45C 0   NAMT    -     46C 0  NTAP    -    62C 0  NRT     -    66C 0  KNR     -    72C 0
KAT     -    76C 0    LDW     -   102C 0   LSTP    -    106C 0  BG      -   112C 0  DOUT    -   116C 0  NDTAP   -   122C 0
ITAP    -   126C 0    MTLAB   -   132C 0   PRTDAY  -    442C 0  LDWP    -   443C 0  LPSTP   -   444C 0  LSTDA   -   445C 0
IDMDA   -   446C 0    IDMDB   -   447C 0   IDMDC   -    450C 0  IDMDD   -   451C 0  NDIM    -   452C 0  NDIM1   -   453C 0
NDIM2   -   454C 0    NDSK1   -   455C 0   NDSK2   -    456C 0  NDSK3   -   457C 0  NDSK4   -   460C 0  NDSK5   -   461C 0
NDSK6   -   462C 0    NDSK7   -   463C 0   NDSK8   -    464C 0  MSUN    -   465C 0  MSUI    -   466C 0  LMIN1   -   467C 0
LMIN2   -   470C 0    IBSCAN  -   471C 0   MSCAN   -    472C 0  EPSL    -   473C 0  ALPHAR  -   474C 0  ALPHA1  -   475C 0
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PWGT   -     476C 0  DTIME1 -     477C 0  DTIME2 -     500C 0  MSWP   -     501C 0  MCOUNT -     502C 0  MSLCT  -     503C 0
LGLTIJ -     506C 0  XXX    -     536C 0  DAYT   -     574C 0  KDATT  -     575C 0  IBT    -     576C 0  PT     -     577C 0
KT     -    1754C 0  UT     -    1755C 0  VT     -    3132C 0  WT     -    4307C 0  ST     -    5464C 0  TT     -    6641C 0
PPT    -   10016C 0  RES    -   11173C 0  UTM    -   12350C 0  VTM    -   13525C 0  DAYB   -       0C 1  KDATB  -       1C 1
IMAXT  -       2C 1  NIB    -       3C 1  VIBT   -       4C 1  IUNDF  -       5C 1  RUNDF  -       6C 1  FLAT1  -       7C 1
FLAT2  -      10C 1  FLONG1 -      11C 1  FLONG2 -      12C 1  SO     -      13C 1  TO     -      14C 1  RDO    -      15C 1
ALPHA  -      16C 1  B      -      17C 1  HEATC  -      20C 1  PI     -      21C 1  RE     -      22C 1  G      -      23C 1
VISY   -      24C 1  SVISY  -      25C 1  TVISY  -      26C 1  VISZ   -      27C 1  SVISZ  -      30C 1  TVISZ  -      31C 1
POWER  -      32C 1  TAREA  -      33C 1  JAREA  -      34C 1  TVOL   -      35C 1  UVOL   -      36C 1  TKK    -      37C 1
CSTQ   -      40C 1  CSTE   -      41C 1  SECDAY -      42C 1  DXT    -      43C 1  DXU    -      76C 1  RDXU2  -     131C 1
DYT    -     164C 1  DYU    -     165C 1  RDYU2  -     166C 1  EPSSK  -     167C 1  EPSTK  -     201C 1  RDCRIT -     213C 1
DZ     -     225C 1  DZMH   -     237C 1  Z      -     251C 1  DEPTH  -     263C 1  BETA   -     264C 1  F      -     317C 1
DG     -     352C 1  AYZT   -     364C 1  AUXY   -     376C 1  AXZT   -     431C 1  AXZU   -    1047C 1  AX     -    1465C 1
AY     -    2103C 1  AZ     -    2521C 1  CSX    -    3137C 1  CSY    -    3555C 1  CSZ    -    4173C 1  CTX    -    4205C 1
CTY    -    4623C 1  CTZ    -    5241C 1  VISX   -    5253C 1  SVISX  -    5306C 1  TVISX  -    5341C 1  IBI    -    5374C 1
IMX    -    5375C 1  IMEF1  -    5376C 1  IMEF2  -    5377C 1  JMX    -    5400C 1  JMEF1  -    5401C 1  JMEF2  -    5402C 1
LAN    -    5403C 1  ING    -    5405C 1  INDBL  -    5407C 1  INDBR  -    5442C 1  LSBY   -    5475C 1  IEF1   -    5524C 1
IEF2   -    5557C 1  IND    -    5612C 1  AREAT  -    6767C 1  AREAU  -    6770C 1  VOLT   -    6771C 1  VOLU   -    6772C 1
AREATB -    6773C 1  AREAUB -    6774C 1  VOLTB  -    6775C 1  VOLUB  -    6776C 1  ATXY   -    6777C 1  EPD    -   10154C 1
BP     -       0C 2  DA     -    1150C 2  DB     -    7222C 2  DC     -   15264C 2  KA     -    1160C 2  ZERO   -    1155
IB     -    1462     DAYX   -    1461     KDATX  -    1460     LR     -    1457

         SUBROUTINES CALLED
REWDTP   OUTPTC    CRDINP    PRTDJK    RDBUFL    INDINTG   WTBUFL    WTBUF     QBQRSO

         COMMON BLOCKS AND LENGTHS
CMN1   -  14702    CMN2   -  11331     CMN3   -  23326
    COMPILE TIME =    149    MILLISECS
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CARD             APPROXIMATE
NUMBER           PROGRAM LOCATION
1668                    0             SUBROUTINE INDINTG (IMAX,JMAX,IND,INDB,L,ING)                   INDC.2
1669                    0             DIMENSION IND(IMAX,JMAX),INDB(JMAX), ING(2)                     INDC.3
1670                    0      C  ***INTERCHANGE INDEX AT OVERLAP BOUNDARY BETWEEN IND(I,J) AND INDB(J)INDC.4
1671                    0      C  ----- L=(1,2) = (LEFT, RIGHT) OVERLAP BOUNDARY                      INDC.5
1672                    0             I=ING(L)                                                        INDC.6
1673                    5             IF (I .EQ. 0) RETURN                                            INDC.7
1674                    7             LL=1                                                            INDC.8
1675                   12             IF (L .EQ. 2) LL=-1                                             INDC.9
1676                   14             I=I-LL                                                          INDC.10
1677                   14             DO 4 J=1,JMAX                                                   INDC.11
1678                   14             INDEX=IND(I,J)                                                  INDC.12
1679                   14             IND(I,J)=INDB(J)  $ INDB(J)=INDEX                               INDC.13
1680                   14         4   CONTINUE                                                        INDC.14
1681                   30             RETURN                                                          INDC.15
1682                   31             END                                                             INDC.16

        LENGTH OF ROUTINE   INDINTG       56

        VARIABLE ASSIGNMENTS
IMAX    -      0    JMAX    -     0    IND     -     0    INDB    -     0    L      -     0    ING    -     0
I       -     43    LL      -    42    J       -    41    INDEX   -    40

        SUBROUTINES CALLED
Q8QRSD
    COMPILE TIME =      16    MILLISECS
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
1683               0              SUBROUTINE MAINCL (NDSKP,NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)              MAIN.2
1684               0         C  ========== BEGINING OF DIMENSION CHANGE  ==========                     MAIN.3
1685               0              COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,MAIN.4
1686               0             1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)MAIN.5
1687               0             2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)MAIN.6
1688               0             3,LSTP(4),BG(4),DOUT(4),NDTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,   MAIN.7
1689               0             3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,MAIN.8
1690               0             3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANMAIN.9
1691               0             4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),MAIN.10
1692               0             4LGLTIJ(2,4,3),XXX(30)                                              MAIN.11
1693               0             4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, MAIN.12
1694               0             627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)         MAIN.13
1695               0              COMMON/NLCM/LCMNAM(33,7),LCNT(7),NR1234,NR567                      MAIN.14
1696               0         C  ********** ENDING OF DIMENSION CHANGE  ****************              MAIN.15
1697               0         C   *************FOR NDSK1,2,3,4 ARE ALL LCM***************************MAIN.16
1698               0              DO 500 I=1,NR1234                                                  MAIN.17
1699               2          500  LCMNAM(I,NDSKZ)=LCMNAM(I,NDSKY)                                   MAIN.18
1700               2         C   *************FOR NDSK1,2,3,4 ARE ALL LCM*******END*****************MAIN.19
1701              13              DAYT=DAYS $ KDATT=KDAT                                             MAIN.20
1702              13              DO 5 I=1,4                                                         MAIN.21
1703              13            5  LSTP(I)=LSTP(I)+1                                                 MAIN.22
1704              25              IF (LSTP(1) .EQ. LDW(1)) LSTP(1)=0                                 MAIN.23
1705              30              IF (LSTP(2) .EQ. LDW(2)) LSTP(2)=-1                                MAIN.24
1706              33              DO 6 I=3,4                                                         MAIN.25
1707              35            6  IF (LSTP(I) .EQ. LDW(I)) LSTP(I)=0                                MAIN.26
1708              43              MSUI=MSUI+1                                                        MAIN.27
1709              45              IF (MSUI .EQ. MSUN) GO TO 10                                       MAIN.28
1710              45         C  ***************** NORMAL CALCULATION **********                      MAIN.29
1711              46         C ----- TO CALL CMPTA -----                                             MAIN.30
1712              50              CALL ACALK32 (       NDSKX,       NDSKZ,NDSKR,NDSKW)               MAIN.31
1713              56              CALL NONLIN  (       NDSKX,NDSKZ,NDSKY,NDSKW,NDSKR)                MAIN.32
1714              56         C ----- TO CALL CMPTF -----                                             MAIN.33
1715              65              CALL FCALK32 (       NDSKP,NDSKY,NDSKZ,NDSKR,NDSKW)                MAIN.34
1716              74              CALL RELAX (NDSKW,NDSKR)                                           MAIN.35
1717             100              CALL CNTX (NDSKP,NDSKZ,NDSKY,NDSKR,NDSKW)                          MAIN.36
1718             107              CALL WUVCAL (NDSKY,NDSKZ,NDSKW)                                    MAIN.37
1719             114              CALL WFLOUT (NDSKZ,NDSKY)                                          MAIN.38
1720             120              DAYS=DAYS+DIFDAY                                                   MAIN.39
1721             120              RETURN                                                             MAIN.40
1722             120         C    ************ MONSUND STABLIZING  CALCULATION **********            MAIN.41
1723             122         10  DTIME=DTIME1                                                        MAIN.42
1724             123              MSUI=-1                                                            MAIN.43
1725             123         C ----- TO CALL CMPTA -----                                             MAIN.44
1726             123              CALL ACALK32 (       NDSKX,       NDSKZ,NDSKR,NDSKW)               MAIN.45
1727             133              CALL NONLIN  (       NDSKX,NDSKZ,NDSKY,NDSKW,NDSKR)                MAIN.46
1728             133         C ----- TO CALL CMPTF -----                                             MAIN.47
1729             142              CALL FCALK32 (       NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)                MAIN.48
1730             151              CALL RELAX (NDSKW,NDSKR)                                           MAIN.49
1731             155              CALL CNTX (NDSKX,NDSKZ,NDSKY,NDSKR,NDSKW)                          MAIN.50
1732             164              CALL WUVCAL (NDSKY,NDSKZ,NDSKW)                                    MAIN.51
1733             171              CALL WFLOUT (NDSKZ,NDSKP)                                          MAIN.52
1734             171         C  ------------ MONSUND BACK-WARD ----------                            MAIN.53
1735             175              DAYT=DAYS                                                          MAIN.54
1736             175              MSUI=0                                                             MAIN.55
1737             175         C ----- TO CALL CMPTA -----                                             MAIN.56
1738             175              CALL ACALK32 (       NDSKP,       NDSKZ,NDSKR,NDSKW)               MAIN.57
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CARD              APPROXIMATE
NUMBER           PROGRAM LOCATION
1739                    205             CALL NONLIN  (        NDSKP,NDSKZ,NDSKY,NDSKW,NDSKR)                    MAIN.58
1740                    205       C ----- TO CALL CMPTF -----                                                   MAIN.59
1741                    214             CALL FCALK32 (        NDSKP,NDSKY,NDSKZ,NDSKR,NDSKW)                    MAIN.60
1742                    223             CALL RELAX (NDSKW,NDSKR)                                                MAIN.61
1743                    227             CALL CNTX (NDSKX,NDSKZ,NDSKY,NDSKR,NDSKW)                               MAIN.62
1744                    235             CALL WUVCAL (NDSKY,NDSKZ,NDSKW)                                         MAIN.63
1745                    243             CALL WFLOUT (NDSKZ,NDSKY)                                               MAIN.64
1746                    247             DTIME=DTIME2                                                            MAIN.65
1747                    247             DAYS=DAYS+DIFDAY                                                        MAIN.66
1748                    247             RETURN                                                                  MAIN.67
1749                    252             END                                                                     MAIN.68

          LENGTH OF ROUTINE    MAINCL        402

          VARIABLE ASSIGNMENTS
NDSKP  -       0      NDSKX  -       0      NDSKY  -       0      NDSKZ  -       0      NDSKR  -       0      NDSKW  -       0
DAYS   -      0C 0    KDAT   -      1C 0    DIFDAY -      2C 0    DTIME  -      3C 0    DAYEND -      4C 0    MAXI   -      5C 0
IMAX   -      6C 0    JMAX   -      7C 0    KMAX   -     10C 0    IM1    -     11C 0    JM1    -     12C 0    IP1    -     13C 0
JP1    -     14C 0    I1     -     15C 0    J1     -     16C 0    I2     -     17C 0    J2     -     20C 0    I      -     21C 0
J      -     22C 0    K      -     23C 0    NCARD1 -     24C 0    NCARD  -     25C 0    KSYB   -     26C 0    INKD   -     27C 0
INDEX  -     30C 0    ITIL   -     31C 0    NAMX   -     41C 0    NTPD1  -     44C 0    NTPD2  -     45C 0    NAMT   -     46C 0
NTAP   -     62C 0    NRT    -     66C 0    KNR    -     72C 0    MWT    -     76C 0    LDW    -    102C 0    LSTP   -    106C 0
BG     -    112C 0    DOUT   -    116C 0    NDTAP  -    122C 0    ITAP   -    126C 0    MTLAB  -    132C 0    PRTDAY -    442C 0
LDWP   -    443C 0    LPSTP  -    444C 0    LSTDA  -    445C 0    IDMDA  -    446C 0    IDMDB  -    447C 0    IDMDC  -    450C 0
IDMDD  -    451C 0    NDIM   -    452C 0    NDIM1  -    453C 0    NDIM2  -    454C 0    NDSK1  -    455C 0    NDSK2  -    456C 0
NDSK3  -    457C 0    NDSK4  -    460C 0    NDSK5  -    461C 0    NDSK6  -    462C 0    NDSK7  -    463C 0    NDSK8  -    464C 0
MSUN   -    465C 0    MSUI   -    466C 0    LMIN1  -    467C 0    LMIN2  -    470C 0    IBSCAN -    471C 0    MSCAN  -    472C 0
EPSL   -    473C 0    ALPHAR -    474C 0    ALPHA1 -    475C 0    PWGT   -    476C 0    DTIME1 -    477C 0    DTIME2 -    500C 0
MSWP   -    501C 0    MCOUNT -    502C 0    MSLCT  -    503C 0    LGLTIJ -    506C 0    XXX    -    536C 0    DAYT   -    574C 0
KDATT  -    575C 0    IBT    -    576C 0    PT     -    577C 0    KT     -   1754C 0    UT     -   1755C 0    VT     -   3132C 0
WT     -   4307C 0    ST     -   5464C 0    TT     -   6641C 0    PPT    -  10016C 0    RES    -  11173C 0    UTM    -  12350C 0
VTM    -  13525C 0    LCMNAM -      0C 1    LCNT   -    347C 1    NR1234 -    356C 1    NR567  -    357C 1

          SUBROUTINES CALLED
ACALK32   NONLIN    FCALK32   RELAX     CNTX      WUVCAL    WFLOUT    QBORSD

          COMMON BLOCKS AND LENGTHS
CMN1   -  14702     NLCM   -    360
    COMPILE TIME =      88    MILLISECS
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CARD        APPROXIMATE
NUMBER      PROGRAM LOCATION
1750         0          SUBROUTINE ACALK32 (NDSKX, NDSKZ,NDSKR,NDSKW)                     ACAL.2
1751         0    C  ========== BEGINING OF DIMENSION CHANGE  ==========                  ACAL.3
1752         0          COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,ACAL.4
1753         0         1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)ACAL.5
1754         0         2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)ACAL.6
1755         0         3,LSTP(4),BG(4),DOUT(4),NDTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,   ACAL.7
1756         0         3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,ACAL.8
1757         0         3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANACAL.9
1758         0         4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),ACAL.10
1759         0         4LGLTIJ(2,4,3),XXX(30)                                            ACAL.11
1760         0         4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, ACAL.12
1761         0         527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        ACAL.13
1762         0          DIMENSION XUVR(2484)                                              ACAL.14
1763         0          EQUIVALENCE (PPT(1),XUVR(1))                                      ACAL.15
1764         0          DIMENSION BT(624),DT(3106)                                        ACAL.16
1765         0          EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                               ACAL.17
1766         0          COMMON/CMN2/X(2812),Y(2013)
1767         0          EQUIVALENCE (X(4),NI3), (Y(1),IBI)                                ACAL.19
1768         0          COMMON/CMN3/BP(624),DA(3106),DB(3106),DC(3106)                    ACAL.20
1769         0          DIMENSION P(23,27)                                                ACAL.21
1770         0          DIMENSION UA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)       ACAL.22
1771         0          DIMENSION UB(23,27),VB(23,27),WB(23,27),SB(23,27),TB(23,27)       ACAL.23
1772         0          DIMENSION UC(23,27),VC(23,27),WC(23,27),SC(23,27),TC(23,27)       ACAL.24
1773         0          EQUIVALENCE (BP(1),DAYX),(BP(2),KDATX),(BP(3),IB),(BP(4),P(1))    ACAL.25
1774         0          EQUIVALENCE (DA(1),KA),(DA(2),UA(1)),(DA(623),VA(1)),(DA(1244),WA(ACAL.26
1775         0         11)),(DA(1865),SA(1)),(DA(2486),TA(1))                            ACAL.27
1776         0          EQUIVALENCE (DB(1),KB),(DB(2),UB(1)),(DB(623),VB(1)),(DB(1244),WB(ACAL.28
1777         0         11)),(DB(1865),SB(1)),(DB(2486),TB(1))                            ACAL.29
1778         0          EQUIVALENCE (DC(1),KC),(DC(2),UC(1)),(DC(623),VC(1)),(DC(1244),WC(ACAL.30
1779         0         11)),(DC(1865),SC(1)),(DC(2486),TC(1))                            ACAL.31
1780         0    C  ********** ENDING OF DIMENSION CHANGE  ****************             ACAL.32
1781        10          CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKX) $ CALL REWDTP (NDSKZ)   ACAL.33
1782        16          CALL REWDTP (NDSKR) $ CALL REWDTP (NDSKW)                         ACAL.34
1783        21      10  CALL RDBUFL(NDSK5,IDMDB,Y)                                        ACAL.35
1784        26          CALL RDBUFL (NDSKX,NDIM1,BP)                                      ACAL.36
1785        33          CALL RDBUFL (NDSKR,IDMDC,XUVR)                                    ACAL.37
1786        40          KA=0 $ IBT=IB                                                     ACAL.38
1787        40          CALL BINCPMA (KA,UA,VA,WA,SA,TA)                                  ACAL.39
1788        52          DAYX=DAYT                                                         ACAL.40
1789        52          CALL WTBUFL (NDSKZ,NDIM1,BP)                                      ACAL.41
1790        60          CALL RDBUFL (NDSKX,NDIM2,DB)                                      ACAL.42
1791        66          IF (KB .NE. KMAX) GO TO 11                                        ACAL.43
1792        70       9  CALL ZEROBF  (KC,UC,VC,WC,SC,TC)                                  ACAL.44
1793       100          GO TO 12                                                          ACAL.45
1794       100      11  CALL RDBUFL (NDSKX,NDIM2,DC)                                      ACAL.46
1795       106      12  CALL  CMPTA  (       DAYX,P,KA,UA,VA,WA,SA,TA,KB,UB,VB,WB,SB,TB,KC,ACAL.47
1796       106         1UC,VC,WC,SC,TC)                                                  ACAL.48
1797       134          CALL WTBUFL (NDSKZ,NDIM2,DT)                                      ACAL.49
1798       142          IF (KB .EQ. KMAX) GO TO 20                                        ACAL.50
1799       145          IF (KC .NE. KMAX) GO TO 13                                        ACAL.51
1800       147          CALL ZEROBF  (KA,UA,VA,WA,SA,TA)                                  ACAL.52
1801       157          GO TO 14                                                          ACAL.53
1802       157      13  CALL RDBUFL (NDSKX,NDIM2,DA)                                      ACAL.54
1803       165      14  CALL  CMPTA  (       DAYX,P,KB,UB,VB,WB,SB,TB,KC,UC,VC,WC,SC,TC,KA,ACAL.55
1804       165         1UA,VA,WA,SA,TA)                                                  ACAL.56
1805       213          CALL WTBUFL (NDSKZ,NDIM2,DT)                                      ACAL.57
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
1806               221             IF (KC .EQ. KMAX) GO TO 20                                              ACAL.58
1807               224             IF (KA .NE. KMAX) GO TO 15                                              ACAL.59
1808               225             CALL ZEROBF  (KB,UB,VB,WB,SB,TB)                                        ACAL.60
1809               236             GO TO 16                                                                ACAL.61
1810               236        15   CALL ROBUFL (NDSKX,NDIM2,OB)                                            ACAL.62
1811               244        16   CALL  CMPTA  (      DAYX,P,KC,UC,VC,WC,SC,TC,KA,UA,VA,WA,SA,TA,KB,ACAL.63
1812               244            1UB,VB,WB,SB,TB)                                                         ACAL.64
1813               272             CALL WTBUFL (NDSKZ,NDIM2,OT)                                            ACAL.65
1814               300             IF (KA .EQ. KMAX) GO TO 20                                              ACAL.66
1815               303             IF (KB .NE. KMAX) GO TO 11                                              ACAL.67
1816               305             GO TO 9                                                                 ACAL.68
1817               305        20   CALL WTBUFL (NDSKW,IDMDC,XUVR)                                          ACAL.69
1818               314             IF (IBI .NE. NIB) GO TO 10                                              ACAL.70
1819               316             RETURN                                                                  ACAL.71
1820               316             END                                                                     ACAL.72

        LENGTH OF ROUTINE    ACALK32      345

        VARIABLE ASSIGNMENTS
NDSKX   -       0     NDSKZ   -       0     NDSKR   -       0     NDSKW   -       0     XUVR    -  10016C 0  BT      -     574C 0
DT      -   1754C 0   P       -     3C 2    JA      -   1161C 2   VA      -   2336C 2   WA      -   3513C 2  SA      -    4670C 2
TA      -   6045C 2   UB      -   7223C 2   VB      -  10400C 2   WB      -  11555C 2   SB      -  12732C 2  TB      -   14107C 2
UC      -  15265C 2   VC      -  16442C 2   WC      -  17617C 2   SC      -  20774C 2   TC      -  22151C 2  DAYS    -       0C 0
KDAT    -      1C 0   DIFDAY  -     2C 0    DTIME   -      3C 0   DAYEND  -      4C 0   MAXI    -      5C 0  IMAX    -       6C 0
JMAX    -      7C 0   KMAX    -    10C 0    IM1     -     11C 0   JM1     -     12C 0   IP1     -     13C 0  JP1     -      14C 0
I1      -     15C 0   J1      -    16C 0    I2      -     17C 0   J2      -     20C 0   I       -     21C 0  J       -      22C 0
K       -     23C 0   NCARD1  -    24C 0    NCARD   -     25C 0   KSYB    -     26C 0   INKD    -     27C 0  INDEX   -      30C 0
ITIL    -     31C 0   NAMX    -    41C 0    NTPD1   -     44C 0   NTPD2   -     45C 0   NAMT    -     46C 0  NTAP    -      62C 0
NRT     -     65C 0   KNR     -    72C 0    MWT     -     76C 0   LOW     -    102C 0   LSTP    -    106C 0  BG      -     112C 0
OUUT    -    115C 0   NOTAP   -   122C 0    ITAP    -    126C 0   MTLAB   -    132C 0   PRTDAY  -    442C 0  LOWP    -     443C 0
LPSTP   -    444C 0   LSTDA   -   445C 0    IDMDA   -    446C 0   IDMDB   -    447C 0   IDMDC   -    450C 0  IDMDD   -     451C 0
NDIM    -    452C 0   NDIM1   -   453C 0    NDIM2   -    454C 0   NDSK1   -    455C 0   NDSK2   -    456C 0  NDSK3   -     457C 0
NDSK4   -    460C 0   NDSK5   -   461C 0    NDSK6   -    462C 0   NDSK7   -    463C 0   NDSK8   -    464C 0  MSJN    -     465C 0
MSUI    -    466C 0   LMIN1   -   467C 0    LMIN2   -    470C 0   IBSCAN  -    471C 0   MSCAN   -    472C 0  EPSL    -     473C 0
ALPHAR  -    474C 0   ALPHA1  -   475C 0    PWGT    -    476C 0   DTIME1  -    477C 0   DTIME2  -    500C 0  MSWP    -     501C 0
MCOUNT  -    502C 0   MSLCT   -   503C 0    LGLTIJ  -    506C 0   XXX     -    536C 0   DAYT    -    574C 0  KDATT   -     575C 0
IBT     -    576C 0   PT      -   577C 0    KT      -   1754C 0   UT      -   1755C 0   VT      -   3132C 0  WT      -    4307C 0
ST      -   5464C 0   TT      -  6641C 0    PPT     -  10016C 0   RES     -  11173C 0   UTM     -  12350C 0  VTM     -   13525C 0
X       -      0C 1   Y       -  5374C 1    BP      -      0C 2   DA      -   1160C 2   DB      -   7222C 2  DC      -   15264C 2
NIB     -      3C 1   IBI     -  5374C 1    DAYX    -      0C 2   KDATX   -      1C 2   IB      -      2C 2  KA      -    1160C 2
KB      -   7222C 2   KC      - 15254C 2

        SUBROUTINES CALLED
REWDTP    RDBUFL    BINCPMA    WTBUFL    ZEROBF    CMPTA    QBQRSD

        COMMON BLOCKS AND LENGTHS
CMN1    -  14702       CMN2    -  11331      CMN3    -  23326
     COMPILE TIME =     103    MILLISECS
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CARD         APPROXIMATE
NUMBER     PROGRAM LOCATION
1821            0                SUBROUTINE CMPTA (DAYX,   P,KM1,UA,VA,WA,SA,TA,KB,UB,VB,WB,SB,TB, CPTA.2
1822            0               1KP1,UC,VC,WC,SC,TC)                                                 CPTA.3
1823            0          C  ========== BEGINING OF DIMENSION CHANGE  ==========                    CPTA.4
1824            0                COMMON  BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
1825            0               1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
1826            0                COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,CPTA.5
1827            0               1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)CPTA.6
1828            0               2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)CPTA.7
1829            0               3,LSTP(4),BG(4),DOUT(4),NDTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,   CPTA.8
1830            0               3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,CPTA.9
1831            0               3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANCPTA.10
1832            0               4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3);CPTA.11
1833            0               4LGLTIJ(2,4,3),XXX(30)                                              CPTA.12
1834            0               4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23,  CPTA.13
1835            0               627),TT(23,27),  PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)       CPTA.14
1836            0                DIMENSION XUVR(2484)                                                CPTA.15
1837            0                EQUIVALENCE (PPT(1),XUVR(1))                                        CPTA.16
1838            0                COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,      CPTA.17
1839            0               1FLONG1,FLONG2,SO,TO,RDO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,    CPTA.18
1840            0               2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,CPTA.19
1841            0               3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITCPTA.20
1842            0               4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  CPTA.21
1843            0               1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  CPTA.22
1844            0               6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISK( CPTA.23
1845            0               727),SVISK(27),TVISK(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   CPTA.24
1846            0               8LAN(2),INC(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( CPTA.25
1847            0               923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)CPTA.26
1848            0               1,EPD(23,27)
1849            0                DIMENSION P(23,27)                                                  CPTA.30
1850            0                DIMENSION UA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)         CPTA.31
1851            0                DIMENSION UB(23,27),VB(23,27),WB(23,27),SB(23,27),TB(23,27)         CPTA.32
1852            0                DIMENSION UC(23,27),VC(23,27),WC(23,27),SC(23,27),TC(23,27)         CPTA.33
1853            0                DIMENSION PP(23,27)                                                 CPTA.34
1854            0          C  ********** ENDING OF DIMENSION CHANGE  ****************                CPTA.35
1855            0          C  ****** INPUT PPT(I,J) (INCLUDING BLOCK OVERLAP BOUNDARY) = PT(I,J) OFCPTA.36
1856            0          C  ****** LAST TIME STEP.                                                 CPTA.37
1857            0                EQUIVALENCE(XXX(1),AVS),(XXX(2),AVT),(XXX(3),DENSTY),(XXX(4),XFACTCPTA.38
1858            0               1),(XXX(5),AYZT2),(XXX(6),AUXY8),(XXX(7),AXZU2),(XXX(8),ATXY2),     CPTA.39
1859            0               2(XXX(9),UT1),(XXX(10),UT2),(XXX(11),UT3),(XXX(12),UT4),(XXX(13),   CPTA.40
1860            0               3UT12),(XXX(14),VT1),(XXX(15),VT2),(XXX(16),VT3),(XXX(17),VT4),     CPTA.41
1861            0               4(XXX(18),VT12),(XXX(19),AVWA),(XXX(20),AVWB),(XXX(21),PP1),(XXX(22CPTA.42
1862            0               5),PP2),(XXX(23),AYZT4),(XXX(24),AXZU4),(XXX(25),AXZUM4),(XXX(26),  CPTA.43
1863            0               6ST1),(XXX(27),ST2),(XXX(28),ST3),(XXX(29),TT1),(XXX(30),TT2)       CPTA.44
1864            0                EQUIVALENCE (EPD(1),PP(1))
1865            0                DATA C1,C2/1.6,0.4/
1866            0          C *** WHERE C1=2.0*C, C2=2.0*(1.0-C) AND C .GE. 0.5, USE C=.8, .7 OR .6
1867            0          C     CALCULATION OF PRESSURE, PP.                                        CPTA.46
1868            0                KT=KB                                                               CPTA.47
1869            7                IF (KB .EQ. 1) GO TO 51                                             CPTA.48
1870           11                DO 50 J=J1,J2                                                       CPTA.49
1871           11                I1=IEF1(J)-1 $ I2=IEF2(J)+1                                         CPTA.50
1872           11                IF (I1 .LT. 1) I1=1  $ IF (I2 .GT. IMAX) I2=IMAX                    CPTA.51
1873           11                DO 50 I=I1,I2                                                       CPTA.52
1874           30                IF (IND(I,J) .EQ. IUNDF) GO TO 50                                   CPTA.53
1875           30                AVS=(SB(I,J)+SA(I,J))*0.5 $ AVT=(TB(I,J)+TA(I,J))*0.5               CPTA.54
1876           30                DENSTY=1.0-ALPHA*(AVT-TO)+B*(AVS-SO)                                CPTA.55
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CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
1877                 30          PP(I,J)=PP(I,J)+DG(KB)*DENSTY                                     CPTA.56
1878                 30     50   CONTINUE                                                          CPTA.57
1879                 65     51   AYZT2=AYZT(KB)*0.5 $ AYZT4=AYZT(KB)*0.25 $ AXZU4=0.0              CPTA.58
1880                 65          DO 100 J=J1,J2                                                    CPTA.59
1881                 65          JP1=J+1 $ JM1=J-1                                                 CPTA.60
1882                 65          AUXYB=AUXY(J)*0.125 $ AXZU2=AXZU(J,KB)*0.5                        CPTA.61
1883                 65          AXZUM4=AXZU4 $ AXZU4=AXZU(J,KB)*0.25                              CPTA.62
1884                 65          IF (J .NE. JMAX) XFACT=AXZT(J,KB)-AXZT(JP1,KB)                    CPTA.63
1885                 65          I1=IEF1(J) $ I2=IEF2(J)                                           CPTA.64
1886                 65          DO 100 I=I1,I2                                                    CPTA.65
1887                124          IP1=I+1 $ IM1=I-1                                                 CPTA.66
1888                124          IF (IND(I,J)) 100,95,80                                           CPTA.67
1889                124    C     CALCULATION OF (DSU/DX), (DTU/DX), (DSV/DY), (DTV/DY)             CPTA.68
1890                124    C    AXZU4=AXZU(J,KB)/4.0 $ AXZUM4=AXZU(J-1,KB)/4.0 $ AYZT4=AYZT(KB)/4.0CPTA.69
1891                124     80   INDEX=IND(I,J)                                                    CPTA.70
1892                124          GO TO (81,82,83,84,85,86,87,88,89,90,91,92) INDEX                 CPTA.71
1893                124     81   ST1=((SB(I,J)+SB(IM1,J))* UB(IM1,J)             -(SB(IP1,J)+SB(I,JCPTA.72
1894                124         1))* UB(I,J)            )*AYZT4                                    CPTA.73
1895                124          TT1=((TB(I,J)+TB(IM1,J))* UB(IM1,J)             -(TB(IP1,J)+TB(I,JCPTA.74
1896                124         1))* UB(I,J)            )*AYZT4                                    CPTA.75
1897                124          ST2=-(SB(I,JP1)+SB(I,J))*(VB(I,J)+VB(IM1,J))*AXZU4                CPTA.76
1898                124          TT2=-(TB(I,JP1)+TB(I,J))*(VB(I,J)+VB(IM1,J))*AXZU4                CPTA.77
1899                124          GO TO 96                                                          CPTA.78
1900                124     82   ST1=-(SB(IP1,J)+SB(I,J))*(UB(I,J)+UB(I,JM1))*AYZT4                CPTA.79
1901                124          TT1=-(TB(IP1,J)+TB(I,J))*(UB(I,J)+UB(I,JM1))*AYZT4                CPTA.80
1902                124          ST2=(SB(I,J)+SB(I,JM1))* VB(I,JM1)              *AXZUM4-(SB(I,JP1)+CPTA.81
1903                124         1SB(I,J))* VB(I,J)             *AXZU4                              CPTA.82
1904                124          TT2=(TB(I,J)+TB(I,JM1))* VB(I,JM1)              *AXZUM4-(TB(I,JP1)+CPTA.83
1905                124         1TB(I,J))* VB(I,J)             *AXZU4                              CPTA.84
1906                124          GO TO 96                                                          CPTA.85
1907                124     83   ST1=-(SB(IP1,J)+SB(I,J))*UB(I,J)*AYZT4                            CPTA.86
1908                124          TT1=-(TB(IP1,J)+TB(I,J))*UB(I,J)*AYZT4                            CPTA.87
1909                124          ST2=-(SB(I,JP1)+SB(I,J))*VB(I,J)*AXZU4                            CPTA.88
1910                124          TT2=-(TB(I,JP1)+TB(I,J))*VB(I,J)*AXZU4                            CPTA.89
1911                124          GO TO 96                                                          CPTA.90
1912                124     84   ST1=((SB(I,J)+SB(IM1,J))*           UB(IM1,JM1) -(SB(IP1,J)+SB(I,JCPTA.91
1913                124         1))*(UB(I,J)+UB(I,JM1)))*AYZT4                                     CPTA.92
1914                124          TT1=((TB(I,J)+TB(IM1,J))*           UB(IM1,JM1) -(TB(IP1,J)+TB(I,JCPTA.93
1915                124         1))*(UB(I,J)+UB(I,JM1)))*AYZT4                                     CPTA.94
1916                124          ST2=(SB(I,J)+SB(I,JM1))*(VB(I,JM1)+VB(IM1,JM1))*AXZUM4-(SB(I,JP1)+CPTA.95
1917                124         1SB(I,J))* VB(I,J)*AXZU4                                           CPTA.96
1918                124          TT2=(TB(I,J)+TB(I,JM1))*(VB(I,JM1)+VB(IM1,JM1))*AXZUM4-(TB(I,JP1)+CPTA.97
1919                124         1TB(I,J))* VB(I,J)*AXZU4                                           CPTA.98
1920                124          GO TO 96                                                          CPTA.99
1921                124     85   ST1=((SB(I,J)+SB(IM1,J))* UB(IM1,J)             -(SB(IP1,J)+SB(I,JCPTA.100
1922                124         1))*(UB(I,J)+UB(I,JM1)))*AYZT4                                     CPTA.101
1923                124          TT1=((TB(I,J)+TB(IM1,J))* UB(IM1,J)             -(TB(IP1,J)+TB(I,JCPTA.102
1924                124         1))*(UB(I,J)+UB(I,JM1)))*AYZT4                                     CPTA.103
1925                124          ST2=(SB(I,J)+SB(I,JM1))* VB(I,JM1)              *AXZUM4-(SB(I,JP1)+CPTA.104
1926                124         1SB(I,J))*(VB(I,J)+VB(IM1,J))*AXZU4                                CPTA.105
1927                124          TT2=(TB(I,J)+TB(I,JM1))* VB(I,JM1)              *AXZUM4-(TB(I,JP1)+CPTA.106
1928                124         1TB(I,J))*(VB(I,J)+VB(IM1,J))*AXZU4                                CPTA.107
1929                124          GO TO 96                                                          CPTA.108
1930                124     86   ST1=((SB(I,J)+SB(IM1,J))*(UB(IM1,J)+UB(IM1,JM1))-(SB(IP1,J)+SB(I,JCPTA.109
1931                124         1))* UB(I,J))*AYZT4                                                CPTA.110
1932                124          TT1=((TB(I,J)+TB(IM1,J))*(UB(IM1,J)+UB(IM1,JM1))-(TB(IP1,J)+TB(I,JCPTA.111
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APPROXIMATE
PROGRAM LOCATION
     124          1))* UB(I,J))*AYZT4                                                          CPTA.112
     124           ST2=(SB(I,J)+SB(I,JM1))*            VB(IM1,JM1)  *AXZUM4-(SB(I,JP1)+CPTA.113
     124          1SB(I,J))*(VB(I,J)+VB(IM1,J))*AXZU4                                          CPTA.114
     124           TT2=(TB(I,J)+TB(I,JM1))*            VB(IM1,JM1)  *AXZUM4-(TB(I,JP1)+CPTA.115
     124          1TB(I,J))*(VB(I,J)+VB(IM1,J))*AXZU4                                          CPTA.116
     124           GO TO 96                                                                    CPTA.117
     124       87  ST1=((SB(I,J)+SB(IM1,J))*            UB(IM1,JM1)  -(SB(IP1,J)+SB(I,JCPTA.118
     124          1))*          UB(I,JM1)  )*AYZT4                                             CPTA.119
     124           TT1=((TB(I,J)+TB(IM1,J))*            UB(IM1,JM1)  -(TB(IP1,J)+TB(I,JCPTA.120
     124          1))*          UB(I,JM1)  )*AYZT4                                             CPTA.121
     124           ST2=(SB(I,J)+SB(I,JM1))*(VB(I,JM1)+VB(IM1,JM1))*AXZUM4                      CPTA.122
     124           TT2=(TB(I,J)+TB(I,JM1))*(VB(I,JM1)+VB(IM1,JM1))*AXZUM4                      CPTA.123
     124           GO TO 96                                                                    CPTA.124
     124       88  ST1= (SB(I,J)+SB(IM1,J))*(UB(IM1,J)+UB(IM1,JM1))*AYZT4                      CPTA.125
     124           TT1= (TB(I,J)+TB(IM1,J))*(UB(IM1,J)+UB(IM1,JM1))*AYZT4                      CPTA.126
     124           ST2=(SB(I,J)+SB(I,JM1))*            VB(IM1,JM1)  *AXZUM4-(SB(I,JP1)+CPTA.127
     124          1SB(I,J))*          VB(IM1,J)  *AXZU4                                        CPTA.128
     124           TT2=(TB(I,J)+TB(I,JM1))*            VB(IM1,JM1)  *AXZUM4-(TB(I,JP1)+CPTA.129
     124          1TB(I,J))*          VB(IM1,J)  *AXZU4                                        CPTA.130
     124           GO TO 96                                                                    CPTA.131
     124       89  ST1=-(SB(IP1,J)+SB(I,J))*UB(I,JM1)*AYZT4                                    CPTA.132
     124           TT1=-(TB(IP1,J)+TB(I,J))*UB(I,JM1)*AYZT4                                    CPTA.133
     124           ST2=(SB(I,J)+SB(I,JM1))* VB(I,JM1)*AXZUM4                                   CPTA.134
     124           TT2=(TB(I,J)+TB(I,JM1))* VB(I,JM1)*AXZUM4                                   CPTA.135
     124           GO TO 96                                                                    CPTA.136
     124       90  ST1= (SB(I,J)+SB(IM1,J))* UB(IM1,J)*AYZT4                                   CPTA.137
     124           TT1= (TB(I,J)+TB(IM1,J))* UB(IM1,J)*AYZT4                                   CPTA.138
     124           ST2=-(SB(I,JP1)+SB(I,J))*VB(IM1,J)*AXZU4                                    CPTA.139
     124           TT2=-(TB(I,JP1)+TB(I,J))*VB(IM1,J)*AXZU4                                    CPTA.140
     124           GO TO 96                                                                    CPTA.141
     124       91  ST1= (SB(I,J)+SB(IM1,J))*UB(IM1,JM1)*AYZT4                                  CPTA.142
     124           TT1= (TB(I,J)+TB(IM1,J))*UB(IM1,JM1)*AYZT4                                  CPTA.143
     124           ST2=(SB(I,J)+SB(I,JM1))*VB(IM1,JM1)*AXZUM4                                  CPTA.144
     124           TT2=(TB(I,J)+TB(I,JM1))*VB(IM1,JM1)*AXZUM4                                  CPTA.145
     124           GO TO 96                                                                    CPTA.146
     124       92  ST1=((SB(I,J)+SB(IM1,J))*(UB(IM1,J)+UB(IM1,JM1))-(SB(IP1,J)+SB(I,JCPTA.147
     124          1))*          UB(I,JM1)) *AYZT4                                              CPTA.148
     124           TT1=((TB(I,J)+TB(IM1,J))*(UB(IM1,J)+UB(IM1,JM1))-(TB(IP1,J)+TB(I,JCPTA.149
     124          1))*          UB(I,JM1)) *AYZT4                                              CPTA.150
     124           ST2=(SB(I,J)+SB(I,JM1))*(VB(I,JM1)+VB(IM1,JM1))*AXZUM4-(SB(I,JP1)+CPTA.151
     124          1SB(I,J))*          VB(IM1,J) *AXZU4                                         CPTA.152
     124           TT2=(TB(I,J)+TB(I,JM1))*(VB(I,JM1)+VB(IM1,JM1))*AXZUM4-(TB(I,JP1)+CPTA.153
     124          1TB(I,J))*          VB(IM1,J) *AXZU4                                         CPTA.154
     124           GO TO 96                                                                    CPTA.155
     124       95  ST1=((SB(I,J)+SB(IM1,J))*(UB(IM1,J)+UB(IM1,JM1))-(SB(IP1,J)+SB(I,JCPTA.156
     124          1))*(UB(I,J)+UB(I,JM1)))*AYZT4                                               CPTA.157
     124           TT1=((TB(I,J)+TB(IM1,J))*(UB(IM1,J)+UB(IM1,JM1))-(TB(IP1,J)+TB(I,JCPTA.158
     124          1))*(UB(I,J)+UB(I,JM1)))*AYZT4                                               CPTA.159
     124           ST2=(SB(I,J)+SB(I,JM1))*(VB(I,JM1)+VB(IM1,JM1))*AXZUM4-(SB(I,JP1)+CPTA.160
     124          1SB(I,J))*(VB(I,J)+VB(IM1,J))*AXZU4                                          CPTA.161
     124           TT2=(TB(I,J)+TB(I,JM1))*(VB(I,JM1)+VB(IM1,JM1))*AXZUM4-(TB(I,JP1)+CPTA.162
     124          1TB(I,J))*(VB(I,J)+VB(IM1,J))*AXZU4                                          CPTA.163
     124    C      CALCULATION OF (DSW/DZ) AND (DTW/DZ)                                        CPTA.164
     124       96  ATXY2=ATXY(I,J)*0.5                                                         CPTA.165
     124           ST3=((SB(I,J)+SC(I,J))*WB(I,J)-(SB(I,J)+SA(I,J))*WA(I,J))*ATXY2   CPTA.166
     124           TT3=((TB(I,J)+TC(I,J))*WB(I,J)-(TB(I,J)+TA(I,J))*WA(I,J))*ATXY2   CPTA.167
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    APPROXIMATE
 PROGRAM LOCATION
        124           ST(I,J)=ST1+ST2+ST3 $ TT(I,J)=TT1+TT2+TT3                 CPTA.168
        124           IF (IND(I,J) .GT. 6) GO TO 100                            CPTA.169
        124      C    CALCULATION OF NON-LINEAR TERMS, UT1, VT1.                CPTA.170
        124      C    XFACT=AXZT(J,K)-AXZT(JP1,K)                               CPTA.171
        124           XFACTU=XFACT*UB(I,J)                                      CPTA.172
        124           UT2=VB(I,J)*XFACTU $ VT2=-UB(I,J)*XFACTU                  CPTA.173
        124      C *********UT1, VT1 RESERVED FOR NON-LINEAR TERMS              CPTA.174
        124      C    UT12=UT1+UT2 $ VT12=VT1+VT2                               CPTA.175
        124      C    UTM(I,J)=UTM(I,J)+UT12 $ VTM(I,J)=VTM(I,J)+VT12           CPTA.176
        124           UTM(I,J)=UTM(I,J)+UT2  $ VTM(I,J)=VTM(I,J)+VT2            CPTA.177
        124      C    CALCULATION OF (DUW/DZ) AND (DVW/DZ)                      CPTA.178
        124      C    AUXY8=AUXY(J)/8.0                                         CPTA.179
        124           AVWB=WB(I,J)+WB(I,JP1)+WB(IP1,JP1)+WB(IP1,J)              CPTA.180
        124           AVWA=WA(I,J)+WA(I,JP1)+WA(IP1,JP1)+WA(IP1,J)              CPTA.181
        124           UT3=((UB(I,J)+UC(I,J))*AVWB-(UB(I,J)+UA(I,J))*AVWA)*AUXY8 CPTA.182
        124           VT3=((VB(I,J)+VC(I,J))*AVWB-(VB(I,J)+VA(I,J))*AVWA)*AUXY8 CPTA.183
        124      C    AYZT2=AYZT(KB)/2.0 $ AXZU2=AXZU(J,KB)/2.0                 CPTA.184
        124      C    CALCULATION OF (DPRS/DX) AND (DPRS/DY), PRS=PRESSURE.     CPTA.185
        124           PP1=PP(I,JP1)-PP(IP1,J) $ PP2=PP(I,J)-PP(IP1,JP1)         CPTA.186
        124           UT4=(PP2+PP1)*AYZT2 $ VT4=(PP2-PP1)*AXZU2                 CPTA.187
        124      C    UT(I,J)=UT12+UT3+UT4 $ VT(I,J)=VT12+VT3+VT4               CPTA.188
        124           UT(I,J)=UT2 +UT3+UT4 $ VT(I,J)=VT2 +VT3+VT4               CPTA.189
        124       100 CONTINUE                                                  CPTA.190
       1046           IF (IBI .EQ. NIB) GO TO 104                               CPTA.191
       1046      C **FOR IBI .NE. NIB                                           CPTA.192
       1046      C **STORE UB(II,J),VB(II,J) FOR ALL J, IN BUT(J,IB+1,KB), BVT(J,IB+1,KB)CPTA.193
       1046      C **TO BE USED IN SUBROUTINE NONLIN. (WHERE II=IMEF2-1)        CPTA.194
       1050           IBP1=IBI+1 $ I=IMEF2-1                                    CPTA.195
       1053           DO 120 J=1,JMAX                                           CPTA.196
       1053           BUT(J,IBP1,KB)=UB(I,J) $ BVT(J,IBP1,KB)=VB(I,J)           CPTA.197
       1053       120 CONTINUE                                                  CPTA.198
       1074       104 IF (KB .NE. KMAX) RETURN                                  CPTA.199
       1076           DO 110 J=J1,J2                                            CPTA.200
       1076           JP1=J+1 $ JM1=J-1                                         CPTA.201
       1076           I1=IEF1(J) $ I2=IEF2(J)                                   CPTA.202
       1076           DO 110 I=I1,I2                                            CPTA.203
       1103           IF (IND(I,J)) 110,106,105                                 CPTA.204
       1103       105 RES(I,J)=0.0                                              CPTA.205
       1103           GO TO 110                                                 CPTA.206
       1103       106 IP1=I+1 $ IM1=I-1                                         CPTA.207
       1103           RES(I,J)=PPT(IP1,J)+PPT(IM1,J)+PPT(I,JP1)+PPT(I,JM1)-PPT(I,J)*PWGTCPTA.208
       1103           RES(I,J)=RES(I,J)+(C1*(P(IP1,J)-P(I,J))+C2*(P(I,J)-P(IM1,J)))*BETA
       1103          1(J)
       1103       110 CONTINUE                                                  CPTA.210
       1163           RETURN                                                    CPTA.211
       1164           END                                                       CPTA.212

     LENGTH OF ROUTINE   CMPTA       1643

     VARIABLE ASSIGNMENTS
DAYX  -       0   P     -       0   KM1    -       0   UA    -       0   VA     -       0   WA    -       0
SA    -       0   TA    -       0   KB     -       0   UB    -       0   VB     -       0   WB    -       0
SB    -       0   TB    -       0   KP1    -       0   UC    -       0   VC     -       0   WC    -       0
SC    -       0   TC    -       0   XUVR   - 10016C 1  PP    - 10154C 2  BPT    -     0C 0  BUT   -   154C 0
BVT   -  2244C 0  BST   -  4334C 0  BTT    -  6424C 0  BUTM  - 10514C 0  BVTM   - 10670C 0  BPTEP - 11044C 0
DAYS  -     0C 1  KDAT  -     1C 1  DIFDAY -     2C 1  DTIME -     3C 1  DAYEND -     4C 1  MAXI  -     5C 1
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IMAX   -      5C 1  JMAX   -      7C 1  KMAX   -      10C 1  IM1    -      11C 1  JM1    -      12C 1  IP1    -      13C 1
JP1    -     14C 1  I1     -     15C 1  J1     -      16C 1  I2     -      17C 1  J2     -      20C 1  I      -      21C 1
J      -     22C 1  K      -     23C 1  NCARD1 -      24C 1  NCARD  -      25C 1  KSYB   -      26C 1  INKD   -      27C 1
INDEX  -     30C 1  ITIL   -     31C 1  NAMX   -      41C 1  NTPD1  -      44C 1  NTPD2  -      45C 1  NAMT   -      46C 1
NTAP   -     62C 1  NRT    -     56C 1  KNR    -      72C 1  MWT    -      76C 1  LDW    -     102C 1  LSTP   -     106C 1
RG     -    112C 1  DDUT   -    116C 1  NDTAP  -     122C 1  ITAP   -     126C 1  MTLAB  -     132C 1  PRTDAY -     442C 1
LDWP   -    443C 1  LPSTP  -    444C 1  LSTDA  -     445C 1  IDMDA  -     446C 1  IDMDB  -     447C 1  IDMDC  -     450C 1
IDMDD  -    451C 1  NDIM   -    452C 1  NDIM1  -     453C 1  NDIM2  -     454C 1  NDSK1  -     455C 1  NDSK2  -     456C 1
NDSK3  -    457C 1  NDSK4  -    460C 1  NDSK5  -     461C 1  NDSK6  -     462C 1  NDSK7  -     463C 1  NDSK8  -     464C 1
MSUN   -    465C 1  MSUI   -    466C 1  LMIN1  -     467C 1  LMIN2  -     470C 1  IBSCAN -     471C 1  MSCAN  -     472C 1
EPSL   -    473C 1  ALPHAR -    474C 1  ALPHA1 -     475C 1  PWGT   -     476C 1  DTIME1 -     477C 1  DTIME2 -     500C 1
MSWP   -    501C 1  MCDUNT -    502C 1  MSLCT  -     503C 1  LGLTIJ -     506C 1  XXX    -     536C 1  DAYT   -     574C 1
KDATT  -    575C 1  IBT    -    576C 1  PT     -     577C 1  KT     -    1754C 1  UT     -    1755C 1  VT     -    3132C 1
WT     -   4307C 1  ST     -   5464C 1  TT     -    6641C 1  PPT    -   10016C 1  RES    -   11173C 1  UTM    -   12350C 1
VTM    -  13525C 1  DAYB   -      0C 2  KDATB  -       1C 2  IMAXT  -       2C 2  NIB    -       3C 2  NIBT   -       4C 2
IUNDF  -      5C 2  RUNDF  -      6C 2  FLAT1  -       7C 2  FLAT2  -      10C 2  FLDNG1 -      11C 2  FLDNG2 -      12C 2
SO     -     13C 2  TO     -     14C 2  RDO    -      15C 2  ALPHA  -      16C 2  B      -      17C 2  HEATC  -      20C 2
PI     -     21C 2  RE     -     22C 2  G      -      23C 2  VISY   -      24C 2  SVISY  -      25C 2  TVISY  -      26C 2
VISZ   -     27C 2  SVISZ  -     30C 2  TVISZ  -      31C 2  POWER  -      32C 2  TAREA  -      33C 2  JAREA  -      34C 2
TVDL   -     35C 2  UVDL   -     36C 2  TKK    -      37C 2  CSTQ   -      40C 2  CSTE   -      41C 2  SECDAY -      42C 2
DXT    -     43C 2  DXJ    -     76C 2  RDXU2  -     131C 2  DYT    -     164C 2  DYU    -     165C 2  RDYU2  -     166C 2
EPSSK  -    167C 2  EPSTK  -    201C 2  RDCRIT -     213C 2  DZ     -     225C 2  DZMH   -     237C 2  Z      -     251C 2
DEPTH  -    263C 2  BETA   -    264C 2  F      -     317C 2  DG     -     352C 2  AYZT   -     364C 2  AUXY   -     376C 2
AXZT   -    431C 2  AXZU   -   1047C 2  AX     -    1465C 2  AY     -    2103C 2  AZ     -    2521C 2  CSX    -    3137C 2
CSY    -   3555C 2  CSZ    -   4173C 2  CTX    -    4205C 2  CTY    -    4623C 2  CTZ    -    5241C 2  VISX   -    5253C 2
SVISX  -   5306C 2  TVISX  -   5341C 2  IBI    -    5374C 2  IMX    -    5375C 2  IMEF1  -    5376C 2  IMEF2  -    5377C 2
JMX    -   5400C 2  JMEF1  -   5401C 2  JMEF2  -    5402C 2  LAN    -    5403C 2  ING    -    5405C 2  INDBL  -    5407C 2
INDBR  -   5442C 2  LSBY   -   5475C 2  IEF1   -    5524C 2  IEF2   -    5557C 2  IND    -    5612C 2  AREAT  -    6767C 2
AREAJ  -   6770C 2  VOLT   -   6771C 2  VOLU   -    6772C 2  AREATB -    6773C 2  AREAUB -    6774C 2  VOLTB  -    6775C 2
VOLUB  -   6776C 2  ATXY   -   6777C 2  EPD    -   10154C 2  AVS    -     536C 1  AVT    -     537C 1  DENSTY -     540C 1
XFACT  -    541C 1  AYZT2  -    542C 1  AUXYB  -     543C 1  AXZU2  -     544C 1  ATXY2  -     545C 1  UT1    -     546C 1
UT2    -    547C 1  UT3    -    550C 1  UT4    -     551C 1  UT12   -     552C 1  VT1    -     553C 1  VT2    -     554C 1
VT3    -    555C 1  VT4    -    556C 1  VT12   -     557C 1  AVWA   -     560C 1  AVWB   -     561C 1  PP1    -     562C 1
PP2    -    563C 1  AYZT4  -    564C 1  AXZU4  -     565C 1  AXZUM4 -     566C 1  ST1    -     567C 1  ST2    -     570C 1
ST3    -    571C 1  TT1    -    572C 1  TT2    -     573C 1  C1     -       0     C2     -       1     TT3    -    1175
XFACTJ -   1174     IBP1   -   1173

        SUBROUTINES CALLED
DGQRSD

        COMMON BLOCKS AND LENGTHS
      -  11220     CMN1   -  14702     CMN2   -  11331
   COMPILE TIME =    858    MILLISECS
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CARD               APPROXIMATE
NUMBER           PROGRAM LOCATION
2035                      0              SUBROUTINE BINCPMA (KA,UA,VA,WA,SA,TA)                                       BINA.2
2036                      0         C  ========== BEGINING OF DIMENSION CHANGE  ==========                            BINA.3
2037                      0              COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,BINA.4
2038                      0             1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)BINA.5
2039                      0             2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)BINA.6
2040                      0             3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  BINA.7
2041                      0             3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,BINA.8
2042                      0             3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANBINA.9
2043                      0             4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),BINA.10
2044                      0             4LGLTIJ(2,4,3),XXX(30)                                                 BINA.11
2045                      0             4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, BINA.12
2046                      0             627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        BINA.13
2047                      0              DIMENSION XUVR(2484)                                                  BINA.14
2048                      0              EQUIVALENCE (PPT(1),XUVR(1))                                          BINA.15
2049                      0              COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,        BINA.16
2050                      0             1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   BINA.17
2051                      0             2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,BINA.18
2052                      0             3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITBINA.19
2053                      0             4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  BINA.20
2054                      0             1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  BINA.21
2055                      0             6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( BINA.22
2056                      0             727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,  BINA.23
2057                      0             3LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( BINA.24
2058                      0             923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)BINA.25
2059                      0             1,EPD(23,27)
2060                      0              DIMENSION JA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)          BINA.27
2061                      0              DIMENSION PP(23,27)                                                   BINA.28
2062                      0         C  ********** ENDING OF DIMENSION CHANGE  ****************                  BINA.29
2063                      0              EQUIVALENCE (EPD(1),PP(1))
2064                      0              KDATT=KDAT                                                            BINA.31
2065                      2              DO 110 J=J1,J2                                                        BINA.32
2066                      2              DO 110 I=1,IMAX                                                       BINA.33
2067                      4              IF (IND(I,J) .EQ. IUNDF) GO TO 110                                    BINA.34
2068                      4              PP(I,J)=0.0                                                           BINA.35
2069                      4              IF (IND(I,J) .LT. 0 .OR. IND(I,J) .GT. 6) GO TO 110                   BINA.36
2070                      4              UTM(I,J)=VTM(I,J)=0.0                                                 BINA.37
2071                      4        110   CONTINUE                                                              BINA.38
2072                     33              CALL ZEROBF (KA,JA,VA,WA,SA,TA)                                       BINA.39
2073                     44              RETURN                                                                BINA.40
2074                     44              END                                                                   BINA.41

          LENGTH OF ROUTINE   BINCPMA        62

          VARIABLE ASSIGNMENTS
KA     -       0       UA      -       0       VA     -       0       WA     -       0       SA      -       0       TA     -       0
XUVR   -  10016C 0     PP      -  10154C 1     DAYS   -      0C 0     KDAT   -      1C 0     DIFDAY  -      2C 0     DTIME  -      3C 0
DAYEND -      4C 0     MAXI    -      5C 0     IMAX   -      6C 0     JMAX   -      7C 0     KMAX    -     10C 0     IM1    -     11C 0
JM1    -     12C 0     IP1     -     13C 0     JP1    -     14C 0     I1     -     15C 0     J1      -     16C 0     I2     -     17C 0
J2     -     20C 0     I       -     21C 0     J      -     22C 0     K      -     23C 0     NCARD1  -     24C 0     NCARD  -     25C 0
KSYB   -     26C 0     INKD    -     27C 0     INDEX  -     30C 0     ITIL   -     31C 0     NAMX    -     41C 0     NTPD1  -     44C 0
NTPD2  -     45C 0     NAMT    -     46C 0     NTAP   -     62C 0     NRT    -     66C 0     KNR     -     72C 0     MWT    -     76C 0
LDW    -    102C 0     LSTP    -    106C 0     BG     -    112C 0     DOUT   -    116C 0     NOTAP   -    122C 0     ITAP   -    126C 0
MTLAB  -    132C 0     PRTDAY  -    442C 0     LDWP   -    443C 0     LPSTP  -    444C 0     LSTDA   -    445C 0*    IDMDA  -    446C 0
IDMDB  -    447C 0     IDMDC   -    450C 0     IDMDD  -    451C 0     NDIM   -    452C 0     NDIM1   -    453C 0     NDIM2  -    454C 0
NDSK1  -    455C 0     NDSK2   -    456C 0     NDSK3  -    457C 0     NDSK4  -    460C 0     NDSK5   -    461C 0     NDSK6  -    462C 0
NDSK7  -    463C 0     NDSK8   -    464C 0     MSUN   -    465C 0     MSUI   -    466C 0     LMIN1   -    467C 0     LMIN2  -    470C 0
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IBSCAN  -     471C 0  MSCAN   -     472C 0  EPSL    -     473C 0  ALPHAR  -     474C 0  ALPHA1  -     475C 0  PWGT    -     476C 0
DTIME1  -     477C 0  DTIME2  -     500C 0  MSWP    -     501C 0  MCOUNT  -     502C 0  MSLCT   -     503C 0  LGLTIJ  -     506C 0
XXX     -     536C 0  DAYT    -     574C 0  KDATT   -     575C 0  IBT     -     576C 0  PT      -     577C 0  KT      -    1754C 0
JT      -    1755C 0  VT      -    3132C 0  WT      -    4307C 0  ST      -    5464C 0  TT      -    6641C 0  PPT     -   10016C 0
RES     -   11173C 0  UTM     -   12350C 0  VTM     -   13525C 0  DAYB    -       0C 1  KDATB   -       1C 1  IMAXT   -       2C 1
NIB     -       3C 1  NIBT    -       4C 1  IUNDF   -       5C 1  RUNDF   -       6C 1  FLAT1   -       7C 1  FLAT2   -      10C 1
FLONG1  -      11C 1  FLONG2  -      12C 1  SO      -      13C 1  TO      -      14C 1  RGO     -      15C 1  ALPHA   -      16C 1
B       -      17C 1  HEATC   -      20C 1  PI      -      21C 1  RE      -      22C 1  G       -      23C 1  VISY    -      24C 1
SVISY   -      25C 1  TVISY   -      26C 1  VISZ    -      27C 1  SVISZ   -      30C 1  TVISZ   -      31C 1  POWER   -      32C 1
TAREA   -      33C 1  UAREA   -      34C 1  TVOL    -      35C 1  UVOL    -      36C 1  TKK     -      37C 1  CSTQ    -      40C 1
CSTE    -      41C 1  SECDAY  -      42C 1  DXT     -      43C 1  DXU     -      76C 1  RDXU2   -     131C 1  DYT     -     164C 1
DYJ     -     165C 1  RDYJ2   -     166C 1  EPSSK   -     167C 1  EPSTK   -     201C 1  RDCRIT  -     213C 1  DZ      -     225C 1
DZMH    -     237C 1  Z       -     251C 1  DEPTH   -     263C 1  BETA    -     264C 1  F       -     317C 1  DG      -     352C 1
AYZT    -     364C 1  AJXY    -     376C 1  AXZT    -     431C 1  AXZU    -    1047C 1  AX      -    1465C 1  AY      -    2103C 1
AZ      -    2521C 1  CSX     -    3137C 1  CSY     -    3555C 1  CSZ     -    4173C 1  CTX     -    4205C 1  CTY     -    4623C 1
CTZ     -    5241C 1  VISX    -    5253C 1  SVISX   -    5306C 1  TVISX   -    5341C 1  IBI     -    5374C 1  IMX     -    5375C 1
IMEF1   -    5376C 1  IMEF2   -    5377C 1  JMX     -    5400C 1  JMEF1   -    5401C 1  JMEF2   -    5402C 1  LAN     -    5403C 1
ING     -    5405C 1  INDBL   -    5407C 1  INDBR   -    5442C 1  LSBY    -    5475C 1  IEF1    -    5524C 1  IEF2    -    5557C 1
END     -    5612C 1  AREAT   -    6767C 1  AREAU   -    6770C 1  VOLT    -    6771C 1  VOLU    -    6772C 1  AREATB  -    6773C 1
AREAJB  -    6774C 1  VOLT3   -    6775C 1  VOLUB   -    6776C 1  ATXY    -    6777C 1  EPD     -   10154C 1

         SUBROUTINES CALLED
ZERDFF    Q8QRSD

         COMMON BLOCKS AND LENGTHS
CMN1    -  14702     CMN2    -  11331
    COMPILE TIME =      65     MILLISECS
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CARD             APPROXIMATE
NUMBER         PROGRAM LOCATION
2075                  0             SUBROUTINE ZEROBF (KA,UA,VA,WA,SA,TA)                             ZROF.2
2076                  0       C  ========== BEGINING OF DIMENSION CHANGE  ==========                  ZROF.3
2077                  0             COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,ZROF.4
2078                  0            1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)ZROF.5
2079                  0            2,NAMX(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)ZROF.6
2080                  0            3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  ZROF.7
2081                  0            3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,ZROF.8
2082                  0            3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANZROF.9
2083                  0            4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),ZROF.10
2084                  0            4LGLTIJ(2,4,3),XXX(30)                                             ZROF.11
2085                  0            4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, ZROF.12
2086                  0            627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        ZROF.13
2087                  0             COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,    ZROF.14
2088                  0            1FLONG1,FLONG2,SO,TO,RDD,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   ZROF.15
2089                  0            2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,ZROF.16
2090                  0            3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITZROF.17
2091                  0            4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  ZROF.18
2092                  0            1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  ZROF.19
2093                  0            6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( ZROF.20
2094                  0            727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,  ZROF.21
2095                  0            8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( ZROF.22
2096                  0            923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)ZROF.23
2097                  0            1,EPD(23,27)
2098                  0             DIMENSION UA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)       ZROF.25
2099                  0             DO 120 J=J1,J2                                                    ZROF.26
2100                  2             I1=IEF1(J)-1 $ I2=IEF2(J)+1                                       ZROF.27
2101                  2             IF (I1 .LT. 1) I1=1                                               ZROF.28
2102                  2             IF (I2 .GT. IMAX) I2=IMAX                                         ZROF.29
2103                  2             DO 120 I=I1,I2                                                    ZROF.30
2104                 20       111   IF (IND(I,J) .EQ. IUNDF) GO TO 120                                ZROF.31
2105                 20             WA(I,J)=SA(I,J)=TA(I,J)=0.0                                       ZROF.32
2106                 20       113   IF (IND(I,J) .GT. 6) GO TO 120                                    ZROF.33
2107                 20       114   UA(I,J)=VA(I,J)=0.0                                               ZROF.34
2108                 20       120   CONTINUE                                                          ZROF.35
2109                 46             RETURN                                                            ZROF.36
2110                 47             END                                                               ZROF.37

         LENGTH OF ROUTINE   ZEROBF        64

         VARIABLE ASSIGNMENTS
KA     -       0     UA     -       0     VA     -       0     WA     -        0     SA     -        0     TA     -        0
DAYS   -     0C 0    KDAT   -     1C 0    DIFDAY -     2C 0    DTIME  -      3C 0    DAYEND -      4C 0    MAXI   -      5C 0
IMAX   -     6C 0    JMAX   -     7C 0    KMAX   -    10C 0    IM1    -     11C 0    JM1    -     12C 0    IP1    -     13C 0
JP1    -    14C 0    I1     -    15C 0    J1     -    16C 0    I2     -     17C 0    J2     -     20C 0    I      -     21C 0
J      -    22C 0    K      -    23C 0    NCARD1 -    24C 0    NCARD  -     25C 0    KSYB   -     26C 0    INKD   -     27C 0
INDEX  -    30C 0    ITIL   -    31C 0    NAMX   -    41C 0    NTPO1  -     44C 0    NTPO2  -     45C 0    NAMT   -     46C 0
NTAP   -    62C 0    NRT    -    66C 0    KNR    -    72C 0    MWT    -     76C 0    LDW    -    102C 0    LSTP   -    106C 0
BG     -   112C 0    DOUT   -   116C 0    NOTAP  -   122C 0    ITAP   -    126C 0    MTLAB  -    132C 0    PRTDAY -    442C 0
LDWP   -   443C 0    LPSTP  -   444C 0    LSTDA  -   445C 0    IDMDA  -    446C 0    IDMDB  -    447C 0    IDMDC  -    450C 0
IDMDD  -   451C 0    NDIM   -   452C 0    NDIM1  -   453C 0    NDIM2  -    454C 0    NDSK1  -    455C 0    NDSK2  -    456C 0
NDSK3  -   457C 0    NDSK4  -   460C 0    NDSK5  -   461C 0    NDSK6  -    462C 0    NDSK7  -    463C 0    NDSK8  -    464C 0
MSUN   -   465C 0    MSUI   -   466C 0    LMIN1  -   467C 0    LMIN2  -    470C 0    IBSCAN -    471C 0    MSCAN  -    472C 0
EPSL   -   473C 0    ALPHAR -   474C 0    ALPHA1 -   475C 0    PWGT   -    476C 0    DTIME1 -    477C 0    DTIME2 -    500C 0
MSWP   -   501C 0    MCOUNT -   502C 0    MSLCT  -   503C 0    LGLTIJ -    506C 0    XXX    -    536C 0    DAYT   -    574C 0
KDATT  -   575C 0    IBT    -   576C 0    PT     -   577C 0    KT     -   1754C 0    UT     -   1755C 0    VT     -   3132C 0
WT     -  4307C 0    ST     -  5464C 0    TT     -  6641C 0    PPT    -  10016C 0    RES    -  11173C 0    UTM    -  12350C 0
```

```
VTM    -   13525C 0  DAYB    -     0C 1  KDATB   -     1C 1  IMAXT   -     2C 1  NIB     -     3C 1  NIBT    -     4C 1
IUNDF  -      5C 1  RUNDF   -     6C 1  FLAT1   -     7C 1  FLAT2   -    10C 1  FLONG1  -    11C 1  FLONG2  -    12C 1
SG     -     13C 1  TO      -    14C 1  ROO     -    15C 1  ALPHA   -    16C 1  B       -    17C 1  HEATC   -    20C 1
PI     -     21C 1  RE      -    22C 1  G       -    23C 1  VISY    -    24C 1  SVISY   -    25C 1  TVISY   -    26C 1
VISZ   -     27C 1  SVISZ   -    30C 1  TVISZ   -    31C 1  POWER   -    32C 1  TAREA   -    33C 1  UAREA   -    34C 1
TVOL   -     35C 1  UVOL    -    36C 1  TKK     -    37C 1  CSTQ    -    40C 1  CSTE    -    41C 1  SECDAY  -    42C 1
DXT    -     43C 1  DXU     -    76C 1  RDXU2   -   131C 1  DYT     -   164C 1  DYU     -   165C 1  RDYU2   -   166C 1
EPSSK  -    167C 1  EPSTK   -   201C 1  RDCRIT  -   213C 1  DZ      -   225C 1  DZMH    -   237C 1  Z       -   251C 1
DEPTH  -    263C 1  BETA    -   264C 1  F       -   317C 1  DG      -   352C 1  AYZT    -   364C 1  AUXY    -   376C 1
AXZT   -    431C 1  AXZU    -  1047C 1  AX      -  1465C 1  AY      -  2103C 1  AZ      -  2521C 1  CSX     -  3137C 1
CSY    -   3555C 1  CSZ     -  4173C 1  CTX     -  4205C 1  CTY     -  4623C 1  CTZ     -  5241C 1  VISX    -  5253C 1
SVISX  -   5306C 1  TVISX   -  5341C 1  IBI     -  5374C 1  IMX     -  5375C 1  IMEF1   -  5376C 1  IMEF2   -  5377C 1
JMX    -   5400C 1  JMEF1   -  5401C 1  JMEF2   -  5402C 1  LAN     -  5403C 1  ING     -  5405C 1  INDBL   -  5407C 1
INDBR  -   5442C 1  LSBY    -  5475C 1  IEF1    -  5524C 1  IEF2    -  5557C 1  IND     -  5612C 1  AREAT   -  6767C 1
AREAU  -   6770C 1  VOLT    -  6771C 1  VOLU    -  6772C 1  AREATB  -  6773C 1  AREAUB  -  6774C 1  VOLTB   -  6775C 1
VOLUB  -   6776C 1  ATXY    -  6777C 1  EPD     - 10154C 1

         SUBROUTINES CALLED
DBQRSD

         COMMON BLOCKS AND LENGTHS
CMN1   -  14702      CMN2   -  11331
    COMPILE TIME =      66    MILLISECS
```

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CARD         APPROXIMATE
NUMBER     PROGRAM LOCATION
                 0              SUBROUTINE NONLIN (NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)                    NONL.2
                 0          C ========== BEGINING OF DIMENSION CHANGE ==========                       NONL.3
                 0              COMMON  BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
                 0             1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
                 0              COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,NONL.4
                 0             1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)NONL.5
                 0             2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)NONL.6
                 0             3,LSTP(4),BS(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  NONL.7
                 0             3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,NONL.8
                 0             3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANNONL.9
                 0             4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),NONL.10
                 0             4LGLTIJ(2,4,3),XXX(30)                                                NONL.11
                 0             4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, NONL.12
                 0             627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        NONL.13
                 0              DIMENSION XUVR(2484)                                                 NONL.14
                 0              EQUIVALENCE (PPT(1),XUVR(1))                                         NONL.15
                 0              DIMENSION BT(624),DT(3106)                                           NONL.16
                 0              EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                                  NONL.17
                 0              COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,      NONL.18
                 0             1FLONG1,FLONG2,SD,TD,RDD,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,     NONL.19
                 0             2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,NONL.20
                 0             3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITNONL.21
                 0             4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  NONL.22
                 0             1AJXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  NONL.23
                 0             6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( NONL.24
                 0             727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   NONL.25
                 0             8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( NONL.26
                 0             923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)NONL.27
                 0             1,EPD(23,27)
                 0              DIMENSION X(2812),Y(2013)
                 0              EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                   NONL.30
                 0              COMMON/CMN3/BP(624),DA(3106),DB(3106),DC(3106)                       NONL.31
                 0              DIMENSION P(23,27)                                                   NONL.32
                 0              DIMENSION UA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)          NONL.33
                 0              EQUIVALENCE (BP(1),DAYX),(BP(2),KDATX),(BP(3),IB),(BP(4),P(1))      NONL.34
                 0              EQUIVALENCE (DA(1),KA),(DA(2),UA(1)),(DA(623),VA(1)),(DA(1244),WA(NONL.35
                 0             11)),(DA(1865),SA(1)),(DA(2486),TA(1))                               NONL.36
                 0              DIMENSION JX(23,27),VX(23,27),UY(23,27),VY(23,27),US(23,27),VS(23,NONL.37
                 0             127),XM(23,27),YM(23,27)                                             NONL.38
                 0              EQUIVALENCE (DB(1),UNL),(DB(2),US(1)),(DB(623),VS(1)),(DB(1244),XMNONL.39
                 0             1(1)),(DB(1865),YM(1)),(DB(2486),UX(1))                              NONL.40
                 0              EQUIVALENCE (DC(1),VNL),(DC(2),VX(1)),(DC(623),UY(1)),(DC(1244),VYNONL.41
                 0             1(1))                                                                 NONL.42
                 0          C ********** ENDING OF DIMENSION CHANGE ***************                  NONL.45
                 0              EQUIVALENCE (XXX(1),JX1),(XXX(2),UX2),(XXX(3),VX1),(XXX(4),VX2),   NONL.46
                 0             1(XXX(5),UY1),(XXX(6),UY2),(XXX(7),VY1),(XXX(8),VY2),(XXX(9),XM1),  NONL.47
                 0             2(XXX(10),XM2),(XXX(11),XM3),(XXX(12),XM4),(XXX(13),YM1),(XXX(14),  NONL.48
                 0             3YM2),(XXX(15),YM3),(XXX(16),YM4),(XXX(17),XM12),(XXX(18),XM34),    NONL.49
                 0             4(XXX(19),YM23),(XXX(20),YM14),(XXX(21),AREX),(XXX(22),AREY),(XXX( NONL.50
                 0             523),UAIM1),(XXX(24),VAIM1)                                          NONL.51
                 0              DATA P1,P2/0.6666666666666666,1.3333333333333333/                   NONL.52
                 0          C *** CORNER POINTS OF INDEX 4,5,6,12 CAN NOT BE CONTINUOUSLY ARRANGED, NONL.53
                 0          C *** DUE TO THIS KIND OF ADJUSTMENTS.                                   NONL.54
                 0          C    ---INPUT BUT(J,IB,KA)=UA(II2,J) OF BLOCK IB-1, II2=IMEF2(IB-1)-1    NONL.55
                 0          C    ---INPUT BVT(J,IB,KA)=VA(II2,J) OF BLOCK IB-1, II2=IMEF2(IB-1)-1    NONL.56
                12              CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKX) $ CALL REWDTP (NDSKY)     NONL.57
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CARD              APPROXIMATE
NUMBER            PROGRAM LOCATION
2167                    23            CALL REWDTP (NDSKZ) $ CALL REWDTP (NDSKR) $ CALL REWDTP (NDSKW)   NONL.58
2168                    26      1000  CALL RDBUFL (NDSK5,IDMDB,Y)                                        NONL.59
2169                    33            CALL RDBUFL (NDSKX,NDIM1,BP)                                       NONL.60
2170                    40            CALL RDBUFL (NDSKR,IDMDC,XUVR)                                     NONL.61
2171                    45            CALL RDBUFL (NDSKY,NDIM1,BT)                                       NONL.62
2172                    52            CALL WTBUFL (NDSKZ,NDIM1,BT)                                       NONL.63
2173                    57      1500  CALL RDBUFL (NDSKX,NDIM2,DA)                                       NONL.64
2174                    64            CALL RDBUFL (NDSKY,NDIM2,DT)                                       NONL.65
2175                    64       C  ************* CALCULATION OF NON-LINEAR TERMS **********             NONL.66
2176                    64       C CALCULATION OF US,VS,UX,VX,UY,VY, INCLUDING ALL OVERLAP BLOCK BOUNDARYNONL.67
2177                    71            AREY=AYZT(KA)*0.5 $ I1=IMEF1-1 $ I2=IMEF2+1                        NONL.68
2178                   102            IF (I1 .LT. 1) I1=1                                                NONL.69
2179                   105            IF (I2 .GT. IMAX) I2=IMAX                                          NONL.70
2180                   110            DO 500 J=J1,J2                                                     NONL.71
2181                   110            AREX=AXZT(J,KA)*0.5 $ JM1=J-1                                      NONL.72
2182                   110            DO 500 I=I1,I2                                                     NONL.73
2183                   111            INDEX=IND(I,J)  $ IM1=I-1                                          NONL.74
2184                   111            IF (INDEX) 282,291,281                                             NONL.75
2185                   111       281  IF (IM1 .NE. 0) GO TO 291                                          NONL.76
2186                   111            UAIM1=RUNDF $ VAIM1=RUNDF                                          NONL.77
2187                   111            GO TO 320                                                          NONL.78
2188                   111       282  IF (INDEX .EQ. IUNDF) GO TO 500                                    NONL.79
2189                   111            IF (I .NE. I1) GO TO 290                                           NONL.80
2190                   111            INDEX=INDBL(J) $ UAIM1=BUT(J,IB,KA) $ VAIM1=BVT(J,IB,KA)           NONL.81
2191                   111            GO TO 292                                                          NONL.82
2192                   111       290  INDEX=INDBR(J)                                                     NONL.83
2193                   111       291  UAIM1=UA(IM1,J) $ VAIM1=VA(IM1,J)                                  NONL.84
2194                   111       292  IF (INDEX) 500,400,320                                             NONL.85
2195                   111       320  GO TO (301,302,303,304,400,301,307,308,307,308,500,312) INDEX      NONL.86
2196                   111       301  UX(I,J)=UA(I,J) $ VX(I,J)=0.0                                      NONL.87
2197                   111            UY(I,J)=(UA(I,J)+UAIM1     )*0.5 $ VY(I,J)=(VA(I,J)+VAIM1     )*0.5 NONL.88
2198                   111            US(I,J)=UX(I,J)*AREY          $ VS(I,J)=VY(I,J)*AXZT(J,KA)         NONL.89
2199                   111            GO TO 500                                                          NONL.90
2200                   111       302  UX(I,J)=(UA(I,J)+UA(I,JM1))*0.5 $ VX(I,J)=(VA(I,J)+VA(I,JM1))*0.5 NONL.91
2201                   111            UY(I,J)=0.0 $ VY(I,J)=VA(I,J)                                      NONL.92
2202                   111            US(I,J)=UX(I,J)*AYZT(KA)     $ VS(I,J)=VY(I,J)*AREX                NONL.93
2203                   111            GO TO 500                                                          NONL.94
2204                   111       303  UX(I,J)=UA(I,J) $ VX(I,J)=0.0                                      NONL.95
2205                   111            UY(I,J)=0.0 $ VY(I,J)=VA(I,J)                                      NONL.96
2206                   111            US(I,J)=UX(I,J)*AREY          $ VS(I,J)=VY(I,J)*AREX               NONL.97
2207                   111            GO TO 500                                                          NONL.98
2208                   111       304  UX(I,J)=(UA(I,J)+UA(I,JM1))*0.5 $ VX(I,J)=(VA(I,J)+VA(I,JM1))*0.5 NONL.99
2209                   111            UY(I,J)=0.0 $ VY(I,J)=VA(I,J)                                      NONL.100
2210                   111            US(I,J)=UX(I,J)*AYZT(KA)     $ VS(I,J)=VY(I,J)*AREX                NONL.101
2211                   111            GO TO 500                                                          NONL.102
2212                   111       307  UX(I,J)=UA(I,JM1) $ VX(I,J)=0.0                                    NONL.103
2213                   111            US(I,J)=UX(I,J)*AREY                                               NONL.104
2214                   111            GO TO 500                                                          NONL.105
2215                   111       308  UY(I,J)=0.0 $ VY(I,J)=VAIM1                                        NONL.106
2216                   111            VS(I,J)=VY(I,J)*AREX                                               NONL.107
2217                   111            GO TO 500                                                          NONL.108
2218                   111       312  UX(I,J)=UA(I,JM1) $ VX(I,J)=0.0                                    NONL.109
2219                   111            UY(I,J)=0.0 $ VY(I,J)=VAIM1                                        NONL.110
2220                   111            US(I,J)=UX(I,J)*AREY          $ VS(I,J)=VY(I,J)*AREX               NONL.111
2221                   111            GO TO 500                                                          NONL.112
2222                   111       400  UX(I,J)=(UA(I,J)+UA(I,JM1))*0.5 $ VX(I,J)=(VA(I,J)+VA(I,JM1))*0.5 NONL.113
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          APPROXIMATE
        PROGRAM LOCATION
           111              UY(I,J)=(UA(I,J)+UAIM1     )*0.5 $ VY(I,J)=(VA(I,J)+VAIM1     )*0.5 NONL.114
           111              US(I,J)=UX(I,J)*AYZT(KA)     $ VS(I,J)=VY(I,J)*AXZT(J,KA)            NONL.115
           111         500  CONTINUE                                                             NONL.116
           111        C** CALCULATION OF XM,YM INCLUDING THE RIGHT (NOT LEFT) OVERLAP BOUNDARYNONL.117
           353              I2=IMEF2+1                                                           NONL.118
           357              IF (I2 .GT. IMAX) I2=IMAX                                            NONL.119
           362              DO 200 J=J1,J2                                                       NONL.120
           362              I1=IEF1(J) $ JM1=J-1                                                 NONL.121
           362              DO 200 I=I1,I2                                                       NONL.122
           370              IM1=I-1                                                              NONL.123
           370              INDEX=IND(I,J)                                                       NONL.124
           370              IF (INDEX) 29,28,20                                                  NONL.125
           370          29  IF (I .NE. I2 .OR. INDEX .EQ. IUNDF) GO TO 200                       NONL.126
           370              INDEX=INDBR(J)                                                       NONL.127
           370              IF (INDEX) 200,28,20                                                 NONL.128
           370          20  GO TO (21,22,23,24,25,26,21,22,23,23,23,27) INDEX                    NONL.129
           370          21  XM(I,J)=US(I,J)+US(IM1,J)                                            NONL.130
           370              YM(I,J)=0.0                                                          NONL.131
           370              GO TO 200                                                            NONL.132
           370          22  XM(I,J)=0.0                                                          NONL.133
           370              YM(I,J)=VS(I,J)+VS(I,JM1)                                            NONL.134
           370              GO TO 200                                                            NONL.135
           370          23  XM(I,J)=0.0                                                          NONL.136
           370              YM(I,J)=0.0                                                          NONL.137
           370              GO TO 200                                                            NONL.138
           370          24  XM(I,J)=(US(I,J)+2.0*US(IM1,J))*0.5                                  NONL.139
           370              YM(I,J)=(VS(I,J)*2.0+VS(I,JM1))*0.5                                  NONL.140
           370              GO TO 200                                                            NONL.141
           370          25  XM(I,J)=(US(I,J)+2.0*US(IM1,J))*0.5                                  NONL.142
           370              YM(I,J)=(VS(I,J)+2.0*VS(I,JM1))*0.5                                  NONL.143
           370              GO TO 200                                                            NONL.144
           370          26  XM(I,J)=(US(I,J)*2.0+US(IM1,J))*0.5                                  NONL.145
           370              YM(I,J)=(VS(I,J)+2.0*VS(I,JM1))*0.5                                  NONL.146
           370              GO TO 200                                                            NONL.147
           370          27  XM(I,J)=(US(I,J)*2.0+US(IM1,J))*0.5                                  NONL.148
           370              YM(I,J)=(VS(I,J)*2.0+VS(I,JM1))*0.5                                  NONL.149
           370              GO TO 200                                                            NONL.150
           370          28  XM(I,J)=(US(I,J)+US(IM1,J))*0.5                                      NONL.151
           370              YM(I,J)=(VS(I,J)+VS(I,JM1))*0.5                                      NONL.152
           370         200  CONTINUE                                                             NONL.153
           370        C CALCULATION OF NON-LINEAR TERM UNL, VNL NOT INCLUDING OVERLAP BOUNDARYNONL.154
           370        C    *****INTERCHANGE INDEX AT OVERLAP BOUNDARY BETWEEN IND(I,J) AND      NONL.155
           370        C    *****INDBL(J), INDBR(J)                                              NONL.156
           527              L=1                                                                  NONL.157
           527              CALL     INDINTS (IMAX,JMAX,IND,INDBL,L,ING)                         NONL.158
           540              L=2                                                                  NONL.159
           540              CALL     INDINTS (IMAX,JMAX,IND,INDBR,L,ING)                         NONL.160
           551              DO 300 J=J1,J2                                                       NONL.161
           551              I1=IEF1(J) $ I2=IEF2(J) $ JP1=J+1 $ JM1=J-1                          NONL.162
           551              DO 300 I=I1,I2                                                       NONL.163
           562              IP1=I+1 $ IM1=I-1                                                    NONL.164
           562              IF (IND(I,J) .LT. 0 .OR. IND(I,J) .GT. 6) GO TO 300                  NONL.165
           562              XM1=XM(I,J) $ YM1=YM(I,J) $ XM2=XM(I,JP1) $ YM2=YM(I,JP1)            NONL.166
           562              XM3=XM(IP1,JP1) $ YM3=YM(IP1,JP1) $ XM4=XM(IP1,J) $ YM4=YM(IP1,J)    NONL.167
           562              UY1=UY(I,J) $ UY2=UY(IP1,J) $ VY1=VY(I,J) $ VY2=VY(IP1,J)            NONL.168
           562              UX1=UX(I,J) $ UX2=UX(I,JP1) $ VX1=VX(I,J) $ VX2=VX(I,JP1)            NONL.169
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CARD             APPROXIMATE
NUMBER        PROGRAM LOCATION
2279              562            IF (IND(I,J) .NE. 4) GO TO 61                                        NONL.170
2280              562            XM1=XM1*P1 $ YM1=YM1*P2 $ UY1=UY(I,JM1) $ VY1=VY(I,JM1)              NONL.171
2281              562            GO TO 64                                                             NONL.172
2282              562         61 IF (IND(I,J) .NE. 5) GO TO 62                                        NONL.173
2283              562            XM1=XM1*P1 $ YM1=YM1*P1                                              NONL.174
2284              562            GO TO 64                                                             NONL.175
2285              562         62 IF (IND(I,J) .NE. 6) GO TO 64                                        NONL.176
2286              562            XM1=XM1*P2 $ YM1=YM1*P1 $ UX1=UX(IM1,J) $ VX1=VX(IM1,J)              NONL.177
2287              562         64 IF (IND(I,JP1) .NE. 4) GO TO 65                                      NONL.178
2288              562            XM2=XM2*P1 $ YM2=YM2*P1                                              NONL.179
2289              562            GO TO 67                                                             NONL.180
2290              562         65 IF (IND(I,JP1) .NE. 5) GO TO 66                                      NONL.181
2291              562            XM2=XM2*P1 $ YM2=YM2*P2 $ UY1=UY(I,JP1) $ VY1=VY(I,JP1)              NONL.182
2292              562            GO TO 67                                                             NONL.183
2293              562         66 IF (IND(I,JP1) .NE. 12) GO TO 67                                     NONL.184
2294              562            XM2=XM2*P2 $ YM2=YM2*P1 $ UX2=UX(IM1,JP1) $ VX2=VX(IM1,JP1)          NONL.185
2295              562         67 IF (IND(IP1,JP1) .NE. 4) GO TO 68                                    NONL.186
2296              562            XM3=XM3*P2 $ YM3=YM3*P1 $ UX2=UX(IP1,JP1) $ VX2=VX(IP1,JP1)          NONL.187
2297              562            GO TO 70                                                             NONL.188
2298              562         68 IF (IND(IP1,JP1) .NE. 6) GO TO 69                                    NONL.189
2299              562            XM3=XM3*P1 $ YM3=YM3*P2 $ UY2=UY(IP1,JP1) $ VY2=VY(IP1,JP1)          NONL.190
2300              562         69 IF (IND(IP1,JP1) .NE. 12) GO TO 70                                   NONL.191
2301              562            XM3=XM3*P1 $ YM3=YM3*P1                                              NONL.192
2302              562         70 IF (IND(IP1,J) .NE. 5) GO TO 71                                      NONL.193
2303              562            XM4=XM4*P2 $ YM4=YM4*P1 $ UX1=UX(IP1,J) $ VX1=VX(IP1,J)              NONL.194
2304              562            GO TO 73                                                             NONL.195
2305              562         71 IF (IND(IP1,J) .NE. 6) GO TO 72                                      NONL.196
2306              562            XM4=XM4*P1 $ YM4=YM4*P1                                              NONL.197
2307              562            GO TO 73                                                             NONL.198
2308              562         72 IF (IND(IP1,J) .NE. 12) GO TO 73                                     NONL.199
2309              562            XM4=XM4*P1 $ YM4=YM4*P2 $ UY2=UY(IP1,JM1) $ VY2=VY(IP1,JM1)          NONL.200
2310              562         73 XM12=XM1+XM2 $ XM34=XM3+XM4 $ YM23=YM2+YM3 $ YM14=YM1+YM4            NONL.201
2311              562            UNL=(XM12*UY1-XM34*UY2+YM14*UX1-YM23*UX2)*0.5                        NONL.202
2312              562            VNL=(XM12*VY1-XM34*VY2+YM14*VX1-YM23*VX2)*0.5                        NONL.203
2313              562            UT(I,J)=UT(I,J)+UNL $ VT(I,J)=VT(I,J)+VNL                            NONL.204
2314              562            UTM(I,J)=UTM(I,J)+UNL $ VTM(I,J)=VTM(I,J)+VNL                        NONL.205
2315              562        300 CONTINUE                                                             NONL.206
2316              562      C   *****INTERCHANGE INDEX AT OVERLAP BOUNDARY BETWEEN IND(I,J) AND        NONL.207
2317              562      C   *****INDBL(J), INDBR(J)                                                NONL.208
2318             1105            L=1                                                                  NONL.209
2319             1105            CALL    INDINTS (IMAX,JMAX,IND,INDBL,L,ING)                          NONL.210
2320             1117            L=2                                                                  NONL.211
2321             1117            CALL    INDINTS (IMAX,JMAX,IND,INDBR,L,ING)                          NONL.212
2322             1117      C  ************* END OF NON-LINEAR CALCULATION **********                  NONL.213
2323             1130            CALL WTBUFL (NDSKZ,NDIM2,OT)                                         NONL.214
2324             1136            IF (KA .NE. KMAX) GO TO 1500                                         NONL.215
2325             1140            CALL WTBUFL (NDSKW,IDMDC,XUVR)                                       NONL.216
2326             1146            IF (IB .NE. NIB) GO TO 1000                                          NONL.217
2327             1150            RETURN                                                               NONL.218
2328             1150            END                                                                  NONL.219

      LENGTH OF ROUTINE   NONLIN      1203

      VARIABLE ASSIGNMENTS
NDSKX  -       0    NDSKY  -       0   NDSKZ  -       0   NDSKR  -       0   NDSKW  -      0   XUVR  -  10016C 1
BT     -  574C 1    OT     -  1754C 1  X      -    0C 2   Y      -  5374C 2  P      -   8C 3   UA    -   1161C 3
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VA     -   2335C 3  WA     -   3513C 3  SA     -   4670C 3  TA     -   6045C 3  UX     -  14107C 3  VX     -  15265C 3
JY     -  16442C 3  VY     -  17517C 3  US     -   7223C 3  VS     -  10400C 3  XM     -  11555C 3  YM     -  12732C 3
BPT    -      0C 0  BJT    -    154C 0  BVT    -   2244C 0  BST    -   4334C 0  BTT    -   6424C 0  BUTM   -  10514C 0
BVTM   -  10670C 0  BPTEP  -  11044C 0  DAYS   -      0C 1  KDAT   -      1C 1  DIFDAY -      2C 1  DTIME  -      3C 1
DAYEND -      4C 1  MAXI   -      5C 1  IMAX   -      6C 1  JMAX   -      7C 1  KMAX   -     10C 1  IM1    -     11C 1
JM1    -     12C 1  IP1    -     13C 1  JP1    -     14C 1  I1     -     15C 1  J1     -     16C 1  I2     -     17C 1
J2     -     20C 1  I      -     21C 1  J      -     22C 1  K      -     23C 1  NCARD1 -     24C 1  NCARD  -     25C 1
KSYB   -     26C 1  INKD   -     27C 1  INDEX  -     30C 1  ITIL   -     31C 1  NAMX   -     41C 1  NTPD1  -     44C 1
NTPD2  -     45C 1  NAMT   -     46C 1  NTAP   -     62C 1  NRT    -     66C 1  KNR    -     72C 1  MWT    -     76C 1
LDW    -    102C 1  LSTP   -    106C 1  BG     -    112C 1  DOUT   -    116C 1  NOTAP  -    122C 1  ITAP   -    126C 1
RTLAB  -    132C 1  PRTDAY -    442C 1  LDWP   -    443C 1  LPSTP  -    444C 1  LSTDA  -    445C 1  IOMDA  -    446C 1
IOMDB  -    447C 1  IOMDC  -    450C 1  IOMDD  -    451C 1  NDIM   -    452C 1  NDIM1  -    453C 1  NDIM2  -    454C 1
NDSK1  -    455C 1  NDSK2  -    456C 1  NDSK3  -    457C 1  NDSK4  -    460C 1  NDSK5  -    461C 1  NDSK6  -    462C 1
NDSK7  -    463C 1  NDSK8  -    464C 1  MSUN   -    465C 1  MSUI   -    466C 1  LMIN1  -    467C 1  LMIN2  -    470C 1
IBSCAN -    471C 1  MSCAN  -    472C 1  EPSL   -    473C 1  ALPHAR -    474C 1  ALPHA1 -    475C 1  PWGT   -    476C 1
DTIME1 -    477C 1  DTIME2 -    500C 1  MSWP   -    501C 1  MCOUNT -    502C 1  MSLCT  -    503C 1  LGLTIJ -    506C 1
XXX    -    536C 1  DAYT   -    574C 1  KDATT  -    575C 1  IBT    -    576C 1  PT     -    577C 1  KT     -   1754C 1
UT     -   1755C 1  VT     -   3132C 1  WT     -   4307C 1  ST     -   5464C 1  TT     -   6641C 1  PPT    -  10016C 1
RES    -  11173C 1  UTM    -  12350C 1  VTM    -  13525C 1  DAYB   -      0C 2  KDATB  -      1C 2  IMAXT  -      2C 2
NIB    -      3C 2  NIBT   -      4C 2  IUNDF  -      5C 2  RUNDF  -      6C 2  FLAT1  -      7C 2  FLAT2  -     10C 2
FLONG1 -     11C 2  FLONG2 -     12C 2  SO     -     13C 2  TO     -     14C 2  ROO    -     15C 2  ALPHA  -     16C 2
B      -     17C 2  HEATC  -     20C 2  PI     -     21C 2  RE     -     22C 2  G      -     23C 2  VISY   -     24C 2
SVISY  -     25C 2  TVISY  -     26C 2  VISZ   -     27C 2  SVISZ  -     30C 2  TVISZ  -     31C 2  POWER  -     32C 2
TAREA  -     33C 2  UAREA  -     34C 2  TVOL   -     35C 2  UVOL   -     36C 2  TKK    -     37C 2  CSTQ   -     40C 2
CSTE   -     41C 2  SECDAY -     42C 2  DXT    -     43C 2  DXU    -     76C 2  RDXU2  -    131C 2  DYT    -    164C 2
DYU    -    165C 2  RDYU2  -    166C 2  EPSSK  -    167C 2  EPSTK  -    201C 2  RDCRIT -    213C 2  DZ     -    225C 2
DZMH   -    237C 2  Z      -    251C 2  DEPTH  -    263C 2  BETA   -    264C 2  F      -    317C 2  DG     -    352C 2
AYZT   -    364C 2  AUXY   -    376C 2  AXZT   -    431C 2  AXZU   -   1047C 2  AX     -   1465C 2  AY     -   2103C 2
AZ     -   2521C 2  CSX    -   3137C 2  CSY    -   3555C 2  CSZ    -   4173C 2  CTX    -   4205C 2  CTY    -   4623C 2
CTZ    -   5241C 2  VISX   -   5253C 2  SVISX  -   5305C 2  TVISX  -   5341C 2  IBI    -   5374C 2  IMX    -   5375C 2
IMEF1  -   5376C 2  IMEF2  -   5377C 2  JMX    -   5400C 2  JMEF1  -   5401C 2  JMEF2  -   5402C 2  LAN    -   5403C 2
ING    -   5405C 2  INDBL  -   5407C 2  INDBR  -   5442C 2  LSBY   -   5475C 2  IEF1   -   5524C 2  IEF2   -   5557C 2
IND    -   5612C 2  AREAT  -   6767C 2  AREAU  -   6770C 2  VOLT   -   6771C 2  VOLU   -   6772C 2  AREATB -   6773C 2
AREAJB -   6774C 2  VOLTB  -   6775C 2  VOLUB  -   6776C 2  ATXY   -   6777C 2  EPD    -  10154C 2  BP     -      0C 3
DA     -   1160C 3  DB     -   7222C 3  DC     -  15264C 3  DAYX   -      0C 3  KDATX  -      1C 3  IB     -      2C 3
KA     -   1160C 3  UNL    -   7222C 3  VNL    -  15264C 3  UX1    -    536C 1  UX2    -    537C 1  VX1    -    540C 1
VX2    -    541C 1  UY1    -    542C 1  JY2    -    543C 1  VY1    -    544C 1  VY2    -    545C 1  XM1    -    546C 1
XM2    -    547C 1  XM3    -    550C 1  XM4    -    551C 1  YM1    -    552C 1  YM2    -    553C 1  YM3    -    554C 1
YM4    -    555C 1  XM12   -    556C 1  XM34   -    557C 1  YM23   -    560C 1  YM14   -    561C 1  AREX   -    562C 1
AREY   -    563C 1  UAIM1  -    564C 1  VAIM1  -    565C 1  P1     -      0     P2     -      1     L      -   1157

         SUBROUTINES CALLED
REWDTP   RDBUFL   WTBUFL   INDINTG   QBQRSD

         COMMON BLOCKS AND LENGTHS
       - 11220     CMN1   -  14702    CMN2   -  11331     CMN3   -  23326
   COMPILE TIME =     530    MILLISECS
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CARD          APPROXIMATE
NUMBER     PROGRAM LOCATION
2329              0              SUBROUTINE FCALK32 (NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)                     FCAL.2
2330              0       C  ========== BEGINING OF DIMENSION CHANGE  ==========                       FCAL.3
2331              0             COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,FCAL.4
2332              0             1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)FCAL.5
2333              0             2,NAMX(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)FCAL.6
2334              0             3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  FCAL.7
2335              0             3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,FCAL.8
2336              0             3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANFCAL.9
2337              0             4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),FCAL.10
2338              0             4LGLTIJ(2,4,3),XXX(30)                                                FCAL.11
2339              0             4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, FCAL.12
2340              0             627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)           FCAL.13
2341              0              DIMENSION XUVR(2484)                                                  FCAL.14
2342              0              EQUIVALENCE (PPT(1),XUVR(1))                                          FCAL.15
2343              0              DIMENSION BT(624),DT(3106)                                            FCAL.16
2344              0              EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                                   FCAL.17
2345              0              COMMON/CMN2/X(2812),Y(2013)
2346              0              EQUIVALENCE (X(4),NIB), (Y(1),IBI)                                   FCAL.19
2347              0              COMMON/CMN3/BP(624),DA(3106),DB(3106),DC(3106)                        FCAL.20
2348              0              DIMENSION P(23,27)                                                    FCAL.21
2349              0              DIMENSION UA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)           FCAL.22
2350              0              DIMENSION UB(23,27),VB(23,27),WB(23,27),SB(23,27),TB(23,27)           FCAL.23
2351              0              DIMENSION UC(23,27),VC(23,27),WC(23,27),SC(23,27),TC(23,27)           FCAL.24
2352              0              EQUIVALENCE (BP(1),DAYX),(BP(2),KDATX),(BP(3),IB),(BP(4),P(1))       FCAL.25
2353              0              EQUIVALENCE (DA(1),KA),(DA(2),UA(1)),(DA(623),VA(1)),(DA(1244),WA(FCAL.26
2354              0             11)),(DA(1865),SA(1)),(DA(2486),TA(1))                                FCAL.27
2355              0              EQUIVALENCE (DB(1),KB),(DB(2),UB(1)),(DB(623),VB(1)),(DB(1244),WB(FCAL.28
2356              0             11)),(DB(1865),SB(1)),(DB(2486),TB(1))                                FCAL.29
2357              0              EQUIVALENCE (DC(1),KC),(DC(2),UC(1)),(DC(623),VC(1)),(DC(1244),WC(FCAL.30
2358              0             11)),(DC(1865),SC(1)),(DC(2486),TC(1))                                FCAL.31
2359              0              COMMON/QTST/DAYFR,KDATFR,IBFR,TAIR(23,27),QT(23,27),STX(23,27),
2360              0             1STY(23,27), IDMQT,IDMF2,IDMF4,LCMFR(65),LCMFRD,NORDER,PERIOD,MAXFR
2361              0             1,RPERD(2),KIND2,KIND4,CAG1,CAG2,CRB1,CRB2,BB2,BB12,AA2,AA12,BVPT,
2362              0             1BV2,CI2,CI3,CB2,CB3,CB4,CH1,CE1,CTX1,DAYSC,XABF(541)
2363              0       C  ********** ENDING OF DIMENSION CHANGE  ****************              FCAL.32
2364             10              CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKX) $ CALL REWDTP (NDSKZ)      FCAL.33
2365             16              CALL REWDTP (NDSKR) $ CALL REWDTP (NDSKW)                             FCAL.34
2366             21              CALL REWDTP (NDSKY)                                                   FCAL.35
2367             24              JSWC=0
2368             24          10  CALL RDBUFL(NDSK5,IDMDB,Y)                                            FCAL.36
2369             32              CALL RDBUFL (NDSKX,NDIM1,BP)                                          FCAL.37
2370             37              CALL RDBUFL (NDSKR,IDMDC,XUVR)                                        FCAL.38
2371             44              KA=0                                                                  FCAL.39
2372             44              CALL RDBUFL (NDSKY,NDIM1,BT)                                          FCAL.40
2373             52              CALL WTBUFL (NDSKZ,NDIM1,BT)                                          FCAL.41
2374             57              CALL RDBUFL (NDSKX,NDIM2,DB)                                          FCAL.42
2375             64              CALL QTSTXY (JSWC,TB)
2376             71              IF (KB .EQ. KMAX) GO TO 12                                            FCAL.43
2377             73          11  CALL RDBUFL (NDSKX,NDIM2,DC)                                          FCAL.44
2378            100          12  CALL RDBUFL (NDSKY,NDIM2,DT)                                          FCAL.45
2379            105              CALL  CMPTF  (      DAYX,P,KA,UA,VA,WA,SA,TA,KB,UB,VB,WB,SB,TB,KC,FCAL.46
2380            105             1UC,VC,WC,SC,TC)                                                       FCAL.47
2381            133              CALL WTBUFL (NDSKZ,NDIM2,DT)                                          FCAL.48
2382            141              IF (KB .EQ. KMAX) GO TO 20                                            FCAL.49
2383            144              IF (KC .EQ. KMAX) GO TO 14                                            FCAL.50
2384            146              CALL RDBUFL (NDSKX,NDIM2,DA)                                          FCAL.51
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CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
2385                    153        14   CALL RDBUFL (NDSKY,NDIM2,DT)                                    FCAL.52
2386                    160             CALL   CMPTF  (        DAYX,P,KB,UB,VB,WB,SB,TB,KC,UC,VC,WC,SC,TC,KA,FCAL.53
2387                    160            1UA,VA,WA,SA,TA)                                                FCAL.54
2388                    205             CALL WTBUFL (NDSKZ,NDIM2,DT)                                    FCAL.55
2389                    214             IF (KC  .EQ. KMAX) GO TO 20                                     FCAL.56
2390                    217             IF (KA  .EQ. KMAX) GO TO 16                                     FCAL.57
2391                    221             CALL RDBUFL (NDSKX,NDIM2,DB)                                    FCAL.58
2392                    226        16   CALL RDBUFL (NDSKY,NDIM2,DT)                                    FCAL.59
2393                    233             CALL   CMPTF  (        DAYX,P,KC,UC,VC,WC,SC,TC,KA,UA,VA,WA,SA,TA,KB,FCAL.60
2394                    233            1UB,VB,WB,SB,TB)                                                FCAL.61
2395                    261             CALL WTBUFL (NDSKZ,NDIM2,DT)                                    FCAL.62
2396                    267             IF (KA  .EQ. KMAX) GO TO 20                                     FCAL.63
2397                    272             IF (KB  .NE. KMAX) GO TO 11                                     FCAL.64
2398                    274             GO TO 12                                                        FCAL.65
2399                    274        20   CALL WTBUFL (NDSKW,IDMDC,XUVR)                                  FCAL.66
2400                    303             IF (IBI  .NE.  NIB) GO TO 10                                    FCAL.67
2401                    305             RETURN                                                          FCAL.68
2402                    305             END                                                             FCAL.69

          LENGTH OF ROUTINE    FCALK32       342

          VARIABLE ASSIGNMENTS
NDSKX   -        0     NDSKY   -        0     NDSKZ   -        0     NDSKR   -        0     NDSKW   -        0     XUVR    -   10016C 0
BT      -     574C 0   DT      -    1754C 0   P       -       3C 2   UA      -    1161C 2   VA      -    2336C 2   WA      -    3513C 2
SA      -    4670C 2   TA      -    6045C 2   UB      -    7223C 2   VB      -   10400C 2   WB      -   11555C 2   SB      -   12732C 2
TB      -   14107C 2   UC      -   15255C 2   VC      -   16442C 2   WC      -   17617C 2   SC      -   20774C 2   TC      -   22151C 2
DAYS    -       0C 0   KDAT    -       1C 0   DIFDAY  -       2C 0   DTIME   -       3C 0   DAYEND  -       4C 0   MAXI    -       5C 0
IMAX    -       6C 0   JMAX    -       7C 0   KMAX    -      10C 0   IM1     -      11C 0   JM1     -      12C 0   IP1     -      13C 0
JP1     -      14C 0   I1      -      15C 0   J1      -      16C 0   I2      -      17C 0   J2      -      20C 0   I       -      21C 0
J       -      22C 0   K       -      23C 0   NCARD1  -      24C 0   NCARD   -      25C 0   KSYB    -      26C 0   INKD    -      27C 0
INDEX   -      30C 0   ITIL    -      31C 0   NAMX    -      41C 0   NTP01   -      44C 0   NTP02   -      45C 0   NAMT    -      46C 0
NTAP    -      62C 0   NRT     -      66C 0   KNR     -      72C 0   MWT     -      76C 0   LDW     -     102C 0   LSTP    -     106C 0
BG      -     112C 0   DOUT    -     116C 0   NDTAP   -     122C 0   ITAP    -     126C 0   MTLAB   -     132C 0   PRTDAY  -     442C 0
LOWP    -     443C 0   LPSTP   -     444C 0   LSTDA   -     445C 0   IDMDA   -     446C 0   IDMDB   -     447C 0   IDMDC   -     450C 0
IDMDD   -     451C 0   NDIM    -     452C 0   NDIM1   -     453C 0   NDIM2   -     454C 0   NDSK1   -     455C 0   NDSK2   -     456C 0
NDSK3   -     457C 0   NDSK4   -     460C 0   NDSK5   -     461C 0   NDSK6   -     462C 0   NDSK7   -     463C 0   NDSK8   -     464C 0
MSUN    -     465C 0   MSUI    -     466C 0   LMIN1   -     467C 0   LMIN2   -     470C 0   IBSCAN  -     471C 0   MSCAN   -     472C 0
EPSL    -     473C 0   ALPHAR  -     474C 0   ALPHA1  -     475C 0   PWGT    -     476C 0   DTIME1  -     477C 0   DTIME2  -     500C 0
MSWP    -     501C 0   MCOUNT  -     502C 0   MSLCT   -     503C 0   LGLTIJ  -     506C 0   XXX     -     536C 0   DAYT    -     574C 0
KDATT   -     575C 0   IBT     -     576C 0   PT      -     577C 0   KT      -    1754C 0   UT      -    1755C 0   VT      -    3132C 0
WT      -    4307C 0   ST      -    5464C 0   TT      -    6641C 0   PPT     -   10016C 0   RES     -   11173C 0   UTM     -   12350C 0
VTM     -   13525C 0   X       -       0C 1   Y       -    5374C 1   BP      -       0C 2   DA      -    1160C 2   DB      -    7222C 2
DC      -   15264C 2   DAYFR   -       0C 3   KDATFR  -       1C 3   IBFR    -       2C 3   TAIR    -       3C 3   QT      -    1160C 3
STX     -    2335C 3   STY     -    3512C 3   IDMQT   -    4667C 3   IDMF2   -    4670C 3   IDMF4   -    4671C 3   LCMFR   -    4672C 3
LCMFRD  -    4773C 3   NORDER  -    4774C 3   PERIOD  -    4775C 3   MAXFR   -    4776C 3   RPERD   -    4777C 3   KIND2   -    5001C 3
KIND4   -    5002C 3   CAG1    -    5003C 3   CAG2    -    5004C 3   CRB1    -    5005C 3   CRB2    -    5006C 3   BB2     -    5007C 3
BB12    -    5010C 3   AA2     -    5011C 3   AA12    -    5012C 3   BVPT    -    5013C 3   BV2     -    5014C 3   CI2     -    5015C 3
CI3     -    5016C 3   CB2     -    5017C 3   CB3     -    5020C 3   CB4     -    5021C 3   CH1     -    5022C 3   CE1     -    5023C 3
CTX1    -    5024C 3   DAYSC   -    5025C 3   XABF    -    5026C 3   NIB     -       3C 1   IBI     -    5374C 1   DAYX    -       0C 2
KDATX   -       1C 2   IB      -       2C 2   KA      -    1160C 2   KB      -    7222C 2   KC      -   15264C 2   JSWC    -     313

          SUBROUTINES CALLED
REWDTP    RDBUFL     WTBUFL     QTSTXY     CMPTF      QBQRSD

          COMMON BLOCKS AND LENGTHS
CMN1    -  14702      CMN2    -  11331      CMN3    -  23326      QTST    -   6063
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COMPILE TIME =    114    MILLISECS
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CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
2403                  0          SUBROUTINE CMPTF (DAYX,P,KA,UA,VA,WA,SA,TA,KB,UB,VB,WB,SB,TB,KC,UCCPTF.2
2404                  0         1,VC,WC,SC,TC)                                                      CPTF.3
2405                  0     C  ========== BEGINING OF DIMENSION CHANGE  ==========                   CPTF.4
2406                  0          COMMON  BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
2407                  0         1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
2408                  0          COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,CPTF.5
2409                  0         1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)CPTF.6
2410                  0         2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)CPTF.7
2411                  0         3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  CPTF.8
2412                  0         3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,CPTF.9
2413                  0         3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANCPTF.10
2414                  0         4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),CPTF.11
2415                  0         4LGLTIJ(2,4,3),XXX(30)                                              CPTF.12
2416                  0         4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, CPTF.13
2417                  0         527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        CPTF.14
2418                  0          DIMENSION XUVR(2484)                                               CPTF.15
2419                  0          EQUIVALENCE (PPT(1),XUVR(1))                                       CPTF.16
2420                  0          COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,     CPTF.17
2421                  0         1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   CPTF.18
2422                  0         2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,CPTF.19
2423                  0         3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITCPTF.20
2424                  0         4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  CPTF.21
2425                  0         1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  CPTF.22
2426                  0         6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( CPTF.23
2427                  0         727),SVISX(27),TVISX(27),   IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   CPTF.24
2428                  0         3LAN(2),ING(2),INDSL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( CPTF.25
2429                  0         923,27),AREAT,AREAJ,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)CPTF.26
2430                  0         1,EPD(23,27)
2431                  0          COMMON/QTST/DAYFR,KDATFR,IBFR,TAIR(23,27),QT(23,27),STX(23,27),
2432                  0         1STY(23,27),  XYXYF(636)
2433                  0          DIMENSION P(23,27)                                                 CPTF.30
2434                  0          DIMENSION UA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)        CPTF.31
2435                  0          DIMENSION JB(23,27),VB(23,27),WB(23,27),SB(23,27),TB(23,27)        CPTF.32
2436                  0          DIMENSION UC(23,27),VC(23,27),WC(23,27),SC(23,27),TC(23,27)        CPTF.33
2437                  0     C  ********** ENDING OF DIMENSION CHANGE  ****************              CPTF.35
2438                  0          EQUIVALENCE (XXX(1),SO,I1),(XXX(2),TO,N),(XXX(3),SLAP,SLAPZ),(XXX(CPTF.36
2439                  0         14),TLAP,TLAPZ),(XXX(5),ULAP,ULAPZ),(XXX(6),VLAP,VLAPZ),(XXX(7),S1,CPTF.37
2440                  0         2UU1),(XXX(8),S2,UU2),(XXX(9),S3,UU3),(XXX(10),S4,UU4),(XXX(11),T1,CPTF.38
2441                  0         3VV1),(XXX(12),T2,VV2),(XXX(13),T3,VV3),(XXX(14),T4,VV4),(XXX(15), CPTF.39
2442                  0         4CSYJ,CSZIJK),(XXX(16),CTYJ,CTZIJK),(XXX(17),CSYJ1,CSZKP1),(XXX(18)CPTF.40
2443                  0         5,CTYJ1,CTZKP1),(XXX(19),CSXJ),(XXX(20),CTXJ),(XXX(21),JDEX)       CPTF.41
2444                  0     C    CALCULATION OF LAPLAC. (U,V,S,T)                                   CPTF.43
2445                  0          CSYJ=CTYJ=RUNDF                                                    CPTF.44
2446                  2          DO 50 J=J1,J2                                                      CPTF.45
2447                  2          I1=IEF1(J) $ I2=IEF2(J) $ JM1=J-1 $ JP1=J+1                        CPTF.46
2448                  2          CSXJ=CSX(J,KB) $ CSYJ1=CSYJ $ CSYJ=CSY(J,KB)                       CPTF.47
2449                  2          CTXJ=CTX(J,KB) $ CTYJ1=CTYJ $ CTYJ=CTY(J,KB)                       CPTF.48
2450                  2          DO 50 I=I1,I2                                                      CPTF.49
2451                  5          INDEX=IND(I,J)                                                     CPTF.50
2452                  5          IM1=I-1 $ IP1=I+1                                                  CPTF.51
2453                  5          IF (INDEX) 50,17,18                                                CPTF.52
2454                  5      18  SO=SB(I,J) $ TO=TB(I,J)                                            CPTF.53
2455                  5          S1=S2=S3=S4=T1=T2=T3=T4=RUNDF                                      CPTF.54
2456                  5          IF (IM1 .LT. 1) GO TO 13                                           CPTF.55
2457                  5          S1=SB(IM1,J) $ T1=TB(IM1,J)                                        CPTF.56
2458                  5      13  IF (JM1 .LT. 1) GO TO 14                                           CPTF.57
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CARD                APPROXIMATE
NUMBER            PROGRAM LOCATION
2459                     5           S2=SB(I,JM1) $ T2=TB(I,JM1)                                        CPTF.58
2460                     5       14  IF (IP1 .GT. IMAX) GO TO 15                                        CPTF.59
2461                     5           S3=SB(IP1,J) $ T3=TB(IP1,J)                                        CPTF.60
2462                     5       15  IF (JP1 .GT. JMAX) GO TO 16                                        CPTF.61
2463                     5           S4=SB(I,JP1) $ T4=TB(I,JP1)                                        CPTF.62
2464                     5       16  GO TO (1,2,3,4,5,6,7,8,9,10,11,12) INDEX                           CPTF.63
2465                     5        1  SLAP=(S3-SO-SO +S1)*CSXJ*0.5+(S4-SO)*CSYJ                           CPTF.64
2466                     5           TLAP=(T3-TO-TO +T1)*CTXJ*0.5+(T4-TO)*CTYJ                           CPTF.65
2467                     5           GO TO 23                                                           CPTF.66
2468                     5        2  SLAP=(S3-SO)*CSXJ+((S4-SO)*CSYJ+(S2-SO)*CSYJ1)*0.5                 CPTF.67
2469                     5           TLAP=(T3-TO)*CTXJ+((T4-TO)*CTYJ+(T2-TO)*CTYJ1)*0.5                 CPTF.68
2470                     5           GO TO 23                                                           CPTF.69
2471                     5        3  SLAP=((S3-SO)*CSXJ+(S4-SO)*CSYJ)*0.5                               CPTF.70
2472                     5           TLAP=((T3-TO)*CTXJ+(T4-TO)*CTYJ)*0.5                               CPTF.71
2473                     5           GO TO 23                                                           CPTF.72
2474                     5        4  SLAP=(S3-SO+(S1-SO)*0.5)*CSXJ+(S4-SO)*CSYJ*0.5+(S2-SO)*CSYJ1       CPTF.73
2475                     5           TLAP=(T3-TO+(T1-TO)*0.5)*CTXJ+(T4-TO)*CTYJ*0.5+(T2-TO)*CTYJ1       CPTF.74
2476                     5           GO TO 23                                                           CPTF.75
2477                     5        5  SLAP=(S3-SO+(S1-SO)*0.5)*CSXJ+(S4-SO)*CSYJ+(S2-SO)*CSYJ1*0.5       CPTF.76
2478                     5           TLAP=(T3-TO+(T1-TO)*0.5)*CTXJ+(T4-TO)*CTYJ+(T2-TO)*CTYJ1*0.5       CPTF.77
2479                     5           GO TO 23                                                           CPTF.78
2480                     5        6  SLAP=((S3-SO)*0.5-SO+S1)*CSXJ+(S4-SO)*CSYJ+(S2-SO)*CSYJ1*0.5       CPTF.79
2481                     5           TLAP=((T3-TO)*0.5-TO+T1)*CTXJ+(T4-TO)*CTYJ+(T2-TO)*CTYJ1*0.5       CPTF.80
2482                     5           GO TO 23                                                           CPTF.81
2483                     5        7  SLAP=(S3-SO-SO +S1)*CSXJ*0.5+(S2-SO)*CSYJ1                          CPTF.82
2484                     5           TLAP=(T3-TO-TO +T1)*CTXJ*0.5+(T2-TO)*CTYJ1                          CPTF.83
2485                     5           GO TO 49                                                           CPTF.84
2486                     5        8  SLAP=(S1-SO)*CSXJ+((S4-SO)*CSYJ+(S2-SO)*CSYJ1)*0.5                 CPTF.85
2487                     5           TLAP=(T1-TO)*CTXJ+((T4-TO)*CTYJ+(T2-TO)*CTYJ1)*0.5                 CPTF.86
2488                     5           GO TO 49                                                           CPTF.87
2489                     5        9  SLAP=((S3-SO)*CSXJ+(S2-SO)*CSYJ1)*0.5                              CPTF.88
2490                     5           TLAP=((T3-TO)*CTXJ+(T2-TO)*CTYJ1)*0.5                              CPTF.89
2491                     5           GO TO 49                                                           CPTF.90
2492                     5       10  SLAP=((S1-SO)*CSXJ+(S4-SO)*CSYJ )*0.5                              CPTF.91
2493                     5           TLAP=((T1-TO)*CTXJ+(T4-TO)*CTYJ )*0.5                              CPTF.92
2494                     5           GO TO 49                                                           CPTF.93
2495                     5       11  SLAP=((S1-SO)*CSXJ+(S2-SO)*CSYJ1)*0.5                              CPTF.94
2496                     5           TLAP=((T1-TO)*CTXJ+(T2-TO)*CTYJ1)*0.5                              CPTF.95
2497                     5           GO TO 49                                                           CPTF.96
2498                     5       12  SLAP=((S3-SO)*0.5-SO+S1)*CSXJ+(S4-SO)*CSYJ*0.5+(S2-SO)*CSYJ1       CPTF.97
2499                     5           TLAP=((T3-TO)*0.5-TO+T1)*CTXJ+(T4-TO)*CTYJ*0.5+(T2-TO)*CTYJ1
2500                     5           GO TO 49                                                           CPTF.99
2501                     5       17  SLAP=(SB(IP1,J)-SB(I,J)-SB(I,J)+SB(IM1,J))*CSXJ+(SB(I,JP1)-SB(I,J)CPTF.100
2502                     5          1)*CSYJ+(SB(I,JM1)-SB(I,J))*CSYJ1                                   CPTF.101
2503                     5           TLAP=(TB(IP1,J)-TB(I,J)-TB(I,J)+TB(IM1,J))*CTXJ+(TB(I,JP1)-TB(I,J)CPTF.102
2504                     5          1)*CTYJ+(TB(I,JM1)-TB(I,J))*CTYJ1                                   CPTF.103
2505                     5       23  DO 45 JDEX=1,4                                                     CPTF.104
2506                   457           IMP=I                                                              CPTF.105
2507                   457           GO TO (24,25,26,27) JDEX                                           CPTF.106
2508                   457       24  IF (IM1 .LT. 1) GO TO 41                                           CPTF.107
2509                   457           INDEX=IND(IM1,J)                                                   CPTF.108
2510                   457           IMP=IM1                                                            CPTF.109
2511                   457           GO TO 28                                                           CPTF.110
2512                   457       25  IF (JM1 .LT. 1) GO TO 42                                           CPTF.111
2513                   457           INDEX=IND(I,JM1)                                                   CPTF.112
2514                   457           GO TO 28                                                           CPTF.113
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
2515              457      26  INDEX=IND(IP1,J)                                                    CPTF.114
2516              457          IMP=IP1                                                             CPTF.115
2517              457          GO TO 28                                                            CPTF.116
2518              457      27  INDEX=IND(I,JP1)                                                    CPTF.117
2519              457      28  IF (INDEX) 29,35,34                                                 CPTF.118
2520              457      29  IF (INDEX .EQ. IJNDF) GO TO 40                                      CPTF.119
2521              457          II=ING(1)-1                                                         CPTF.120
2522              457          IF (IMP .NE. II) GO TO 30                                           CPTF.121
2523              457          INDEX=INDBL(J)                                                      CPTF.122
2524              457          GO TO 33                                                            CPTF.123
2525              457      30  II=ING(2)+1                                                         CPTF.124
2526              457          IF (IMP.EQ. II) GO TO 32                                            CPTF.125
2527              457    C  XXXXXXXXXXX PRINT ERROR MESSAGE XXXXXXXXXX                             CPTF.126
2528              457          PRINT 31,IBI,ING,(INDBL(N),INDBR(N),N=1,JMAX)                       CPTF.127
2529              637      31  FORMAT (//10X,*XXXXX INCONSISTENT OF ING(I) AND INDBL(J),INDBR(J) CPTF.128
2530              637         1XXXXX CALLED FROM CMPFN *//15X,*-----JOB TERMINATES ABNORMALLY----CPTF.129
2531              637         1-*//     20X,* FOR BLOCK IB =*I4, *  ING(1),ING(2) =*2I5/           CPTF.130
2532              637         1 8X,*(INDBL(J),INDBR(J),J=1,JMAX)=*10(I5,I4)/(37X,10(I5,I4)))      CPTF.131
2533              637          CALL EXIT                                                           CPTF.132
2534              640      32  INDEX=INDBR(J)                                                      CPTF.133
2535              645      33  IF (INDEX .LT. 0) GO TO 40                                          CPTF.134
2536              650      34  IF (INDEX .GT. 6) GO TO 40                                          CPTF.135
2537              652      35  GO TO (36,37,38,39) JDEX                                            CPTF.136
2538              664      36  UU1=UB(IM1,J) $ VV1=VB(IM1,J)                                       CPTF.137
2539              664          GO TO 45                                                            CPTF.138
2540              673      37  UU2=UB(I,JM1) $ VV2=VB(I,JM1)                                       CPTF.139
2541              673          GO TO 45                                                            CPTF.140
2542              702      38  UU3=UB(IP1,J) $ VV3=VB(IP1,J)                                       CPTF.141
2543              702          GO TO 45                                                            CPTF.142
2544              711      39  UU4=UB(I,JP1) $ VV4=VB(I,JP1)                                       CPTF.143
2545              711          GO TO 45                                                            CPTF.144
2546              717      40  GO TO (41,42,43,44) JDEX                                            CPTF.145
2547              732      41  UU1=-UB(I,J) $ VV1=VB(I,J)                                          CPTF.146
2548              732          GO TO 45                                                            CPTF.147
2549              741      42  UU2=UB(I,J) $ VV2=-VB(I,J)                                          CPTF.148
2550              741          GO TO 45                                                            CPTF.149
2551              750      43  UU3=-UB(I,J) $ VV3=VB(I,J)                                          CPTF.150
2552              750          GO TO 45                                                            CPTF.151
2553              757      44  UU4=UB(I,J) $ VV4=-VB(I,J)                                          CPTF.152
2554              757      45  CONTINUE                                                            CPTF.153
2555              767          ULAP=(UU4-UB(I,J))*AY(JP1,KB)-(UB(I,J)-UU2)*AY(J,KB)+(UU3-UB(I,J)-CPTF.154
2556              767         1UB(I,J)+UU1)*AX(J,K3)                                               CPTF.155
2557              767          VLAP=(VV4-VB(I,J))*AY(JP1,KB)-(VB(I,J)-VV2)*AY(J,KB)+(VV3-VB(I,J)-CPTF.156
2558              767         1VB(I,J)+VV1)*AX(J,K3)                                               CPTF.157
2559              767          UT(I,J)=UT(I,J)+ULAP $ VT(I,J)=VT(I,J)+VLAP                         CPTF.158
2560              767          UTM(I,J)=UTM(I,J)+ULAP $ VTM(I,J)=VTM(I,J)+VLAP                     CPTF.159
2561             1032      49  ST(I,J)=ST(I,J)+SLAP $ TT(I,J)=TT(I,J)+TLAP                         CPTF.160
2562             1032      50  CONTINUE                                                            CPTF.161
2563             1032    C     CALCULATION OF VERTICAL DIFUSE TERMS.      (U,V,S,T)                CPTF.162
2564             1050          IF (KB .NE. 1) GO TO 61                                             CPTF.163
2565             1050    C   ******** CALL SUBROUTINE QTEMP TO GET QT, EPD AND AVERAGE QT, EPD     CPTF.164
2566             1052          CALL QTEMPF (SB,TB,QTAV,EMPAV)                                      CPTF.165
2567             1060          DO 60 J=J1,J2                                                       CPTF.166
2568             1060          AJRO=AUXY(J)/RJO                                                    .
2569             1060          I1=IEF1(J) $ I2=IEF2(J)                                             CPTF.167
2570             1060          DO 60 I=I1,I2                                                       CPTF.168
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CARD            APPROXIMATE
NUMBER       PROGRAM LOCATION
2571            1061              IF (IND(I,J) .LT. 0) GO TO 60                                   CPTF.169
2572            1061              QT(I,J)=QT(I,J)*ATXY(I,J)/CSTQ
2573            1061      C   ***********DROP THE FOLLOWING CARD IF AVERAGE NOT WANTED.           CPTF.170
2574            1061              EPD(I,J)=EPD(I,J)-EMPAV*ATXY(I,J)
2575            1061              CSZKP1=CSZ(KC)*ATXY(I,J) $ CTZKP1=CTZ(KC)*ATXY(I,J)             CPTF.172
2576            1061              TLAPZ=           QT(I,J)-(TB(I,J)-TC(I,J))*CTZKP1               CPTF.173
2577            1061              SLAPZ=          EPD(I,J)-(SB(I,J)-SC(I,J))*CSZKP1               CPTF.174
2578            1061              ST(I,J)=ST(I,J)+SLAPZ $ TT(I,J)=TT(I,J)+TLAPZ                   CPTF.175
2579            1061              IF (IND(I,J) .GT. 5) GO TO 60                                   CPTF.176
2580            1061              STX(I,J)=STX(I,J)*AURO $ STY(I,J)=STY(I,J)*AURO
2581            1061              ULAPZ=STX(I,J)-(UB(I,J)-UC(I,J))*AZ(J,KC)                       CPTF.177
2582            1061              VLAPZ=STY(I,J)-(VB(I,J)-VC(I,J))*AZ(J,KC)                       CPTF.178
2583            1061              UT(I,J)=UT(I,J)+ULAPZ $ VT(I,J)=VT(I,J)+VLAPZ                   CPTF.179
2584            1061              UTM(I,J)=UTM(I,J)+STX(I,J) $ VTM(I,J)=VTM(I,J)+STY(I,J)         CPTF.180
2585            1061          60  CONTINUE                                                        CPTF.181
2586            1163              RETURN                                                          CPTF.182
2587            1166          61  IF (KB .EQ. KMAX) GO TO 63                                      CPTF.183
2588            1170              DO 62 J=J1,J2                                                   CPTF.184
2589            1170              I1=IEF1(J) $ I2=IEF2(J)                                         CPTF.185
2590            1170              DO 62 I=I1,I2                                                   CPTF.186
2591            1171              IF (IND(I,J) .LT. 0) GO TO 62                                   CPTF.187
2592            1171              CSZIJK=CSZ(KB)*ATXY(I,J) $ CTZIJK=CTZ(KB)*ATXY(I,J)             CPTF.188
2593            1171              CSZKP1=CSZ(KC)*ATXY(I,J) $ CTZKP1=CTZ(KC)*ATXY(I,J)             CPTF.189
2594            1171              SLAPZ=(SA(I,J)-SB(I,J))*CSZIJK-(SB(I,J)-SC(I,J))*CSZKP1         CPTF.190
2595            1171              TLAPZ=(TA(I,J)-TB(I,J))*CTZIJK-(TB(I,J)-TC(I,J))*CTZKP1         CPTF.191
2596            1171              ST(I,J)=ST(I,J)+SLAPZ $ TT(I,J)=TT(I,J)+TLAPZ                   CPTF.192
2597            1171              IF (IND(I,J) .GT. 5) GO TO 62                                   CPTF.193
2598            1171              ULAPZ=(UA(I,J)-UB(I,J))*AZ(J,KB)-(UB(I,J)-UC(I,J))*AZ(J,KC)     CPTF.194
2599            1171              VLAPZ=(VA(I,J)-VB(I,J))*AZ(J,KB)-(VB(I,J)-VC(I,J))*AZ(J,KC)     CPTF.195
2600            1171              UT(I,J)=UT(I,J)+ULAPZ $ VT(I,J)=VT(I,J)+VLAPZ                   CPTF.196
2601            1171          62  CONTINUE                                                        CPTF.197
2602            1271              RETURN                                                          CPTF.198
2603            1272          63  DO 64 J=J1,J2                                                   CPTF.199
2604            1272              I1=IEF1(J) $ I2=IEF2(J)                                         CPTF.200
2605            1272              DO 64 I=I1,I2                                                   CPTF.201
2606            1274              IF (IND(I,J) .LT. 0) GO TO 64                                   CPTF.202
2607            1274              CSZIJK=CSZ(KB)*ATXY(I,J) $ CTZIJK=CTZ(KB)*ATXY(I,J)             CPTF.203
2608            1274              SLAPZ=(SA(I,J)-SB(I,J))*CSZIJK                                  CPTF.204
2609            1274              TLAPZ=(TA(I,J)-TB(I,J))*CTZIJK                                  CPTF.205
2610            1274              ST(I,J)=ST(I,J)+SLAPZ $ TT(I,J)=TT(I,J)+TLAPZ                   CPTF.206
2611            1274              IF (IND(I,J) .GT. 6) GO TO 64                                   CPTF.207
2612            1274              ULAPZ=(UA(I,J)-UB(I,J))*AZ(J,KB)                                CPTF.208
2613            1274              VLAPZ=(VA(I,J)-VB(I,J))*AZ(J,KB)                                CPTF.209
2614            1274              UT(I,J)=UT(I,J)+ULAPZ $ VT(I,J)=VT(I,J)+VLAPZ                   CPTF.210
2615            1274          64  CONTINUE                                                        CPTF.211
2616            1274      C       VERTICAL MEAN OF UTM, VTM                                       CPTF.212
2617            1354              DO 310 J=J1,J2                                                  CPTF.213
2618            1354              I1=IEF1(J) $ I2=IEF2(J)                                         CPTF.214
2619            1354              DO 310 I=I1,I2                                                  CPTF.215
2620            1356              IF (IND(I,J) .LT. 0 .OR. IND(I,J) .GT. 6) GO TO 310             CPTF.216
2621            1356              UTM(I,J)=UTM(I,J)/DEPTH $ VTM(I,J)=VTM(I,J)/DEPTH               CPTF.217
2622            1356         310  CONTINUE                                                        CPTF.218
2623            1356      C ********* STORE OVERLAP BOUNDARY VALUES OF UTM, VTM, SUCH THAT,       CPTF.219
2624            1356      C ** STORE UTM(ING(L),J),VTM(ING(L),J) IN BUTM(J,LAN(L)),BVTM(J,LAN(L)), CPTF.220
2625            1356      C ** FOR ING(L) .NE. 0,  WHERE L=1,2                                    CPTF.221
2626            1407              DO 316 L=1,2                                                    CPTF.222
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CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
2627                 1407             I=ING(L)                                                      CPTF.223
2628                 1407             IF (I .EQ. 0) GO TO 316                                       CPTF.224
2629                 1407             I1=LAV(L)                                                     CPTF.225
2630                 1407             DO 315 J=1,JMAX                                               CPTF.226
2631                 1416             BUTM(J,I1)=UTM(I,J) $ BVTM(J,I1)=VTM(I,J)                     CPTF.227
2632                 1416       315   CONTINUE                                                      CPTF.228
2633                 1436       316   CONTINUE                                                      CPTF.229
2634                 1441             RETURN                                                        CPTF.230
2635                 1442             END                                                           CPTF.231

        LENGTH OF ROUTINE    CMPTF        1627

        VARIABLE ASSIGNMENTS
DAYX    -        0   P       -        0   KA      -        0   UA      -        0   VA      -        0   WA      -        0
SA      -        0   TA      -        0   KB      -        0   UB      -        0   VB      -        0   WB      -        0
SB      -        0   TB      -        0   KC      -        0   UC      -        0   VC      -        0   WC      -        0
SC      -        0   TC      -        0   KJVR    -   10016C 1 BPT     -      0C 0 BUT     -     154C 0 BVT     -    2244C 0
BST     -    4334C 0 BTT     -    6424C 0 BUTM    -   10514C 0 BVTM    -   10670C 0 BPTEP   -   11044C 0 DAYS    -      0C 1
KDAT    -      1C 1 DIFDAY  -      2C 1 DTIME   -       3C 1 DAYEND  -      4C 1 MAXI    -       5C 1 IMAX    -      6C 1
JMAX    -      7C 1 KMAX    -     10C 1 IM1     -      11C 1 JM1     -     12C 1 IP1     -      13C 1 JP1     -     14C 1
I1      -     15C 1 J1      -     16C 1 I2      -      17C 1 J2      -     20C 1 I       -      21C 1 J       -     22C 1
K       -     23C 1 NCARD1  -     24C 1 NCARD   -      25C 1 KSYB    -     26C 1 INKD    -      27C 1 INDEX   -     30C 1
ITIL    -     31C 1 NAMX    -     41C 1 NTPO1   -      44C 1 NTPO2   -     45C 1 NAMT    -      46C 1 NTAP    -     62C 1
NRT     -     65C 1 KNR     -     72C 1 MWT     -      76C 1 LOW     -    102C 1 LSTP    -     106C 1 BG      -    112C 1
DOUT    -    116C 1 NOTAP   -    122C 1 ITAP    -     126C 1 MTLAB   -    132C 1 PRTDAY  -     442C 1 LOWP    -    443C 1
LPSTP   -    444C 1 LSTDA   -    445C 1 IDMDA   -     446C 1 IDMDB   -    447C 1 IDMDC   -     450C 1 IDMDD   -    451C 1
NDIM    -    452C 1 NDIM1   -    453C 1 NDIM2   -     454C 1 NDSK1   -    455C 1 NDSK2   -     456C 1 NDSK3   -    457C 1
NDSK4   -    460C 1 NDSK5   -    461C 1 NDSK6   -     462C 1 NDSK7   -    463C 1 NDSK8   -     464C 1 MSUN    -    465C 1
MSUI    -    466C 1 LMIN1   -    467C 1 LMIN2   -     470C 1 IBSCAN  -    471C 1 MSCAN   -     472C 1 EPSL    -    473C 1
ALPHAR  -    474C 1 ALPHA1  -    475C 1 PWGT    -     476C 1 DTIME1  -    477C 1 DTIME2  -     500C 1 MSWP    -    501C 1
MCOUNT  -    502C 1 MSLCT   -    503C 1 LGLTIJ  -     506C 1 XXX     -    536C 1 DAYT    -     574C 1 KDATT   -    575C 1
IBT     -    576C 1 PT      -    577C 1 KT      -    1754C 1 UT      -   1755C 1 VT      -    3132C 1 WT      -   4307C 1
ST      -   5464C 1 TT      -   6541C 1 PPT     -   10016C 1 RES     -  11173C 1 UTM     -   12350C 1 VTM     -  13525C 1
DAYB    -      0C 2 KDAT3   -      1C 2 IMAXT   -       2C 2 NIB     -      3C 2 NIBT    -       4C 2 IUNDF   -      5C 2
RUNOF   -      6C 2 FLAT1   -      7C 2 FLAT2   -      10C 2 FLONG1  -     11C 2 FLONG2  -      12C 2 SO      -     13C 2
TO      -     14C 2 ROO     -     15C 2 ALPHA   -      16C 2 B       -     17C 2 HEATC   -      20C 2 PI      -     21C 2
RE      -     22C 2 G       -     23C 2 VISY    -      24C 2 SVISY   -     25C 2 TVISY   -      26C 2 VISZ    -     27C 2
SVISZ   -     30C 2 TVISZ   -     31C 2 POWER   -      32C 2 TAREA   -     33C 2 UAREA   -      34C 2 TVOL    -     35C 2
UVOL    -     36C 2 TKK     -     37C 2 CSTQ    -      40C 2 CSTE    -     41C 2 SECDAY  -      42C 2 DXT     -     43C 2
DXJ     -     76C 2 RDXU2   -    131C 2 DYT     -     164C 2 DYU     -    165C 2 RDYU2   -     166C 2 EPSSK   -    167C 2
EPSTK   -    201C 2 RDCRIT  -    213C 2 DZ      -     225C 2 DZMH    -    237C 2 Z       -     251C 2 DEPTH   -    263C 2
BETA    -    264C 2 F       -    317C 2 DG      -     352C 2 AYZT    -    364C 2 AUXY    -     376C 2 AXZT    -    431C 2
AXZU    -   1047C 2 AX      -   1465C 2 AY      -    2103C 2 AZ      -   2521C 2 CSX     -    3137C 2 CSY     -   3555C 2
CSZ     -   4173C 2 CTX     -   4205C 2 CTY     -    4623C 2 CTZ     -   5241C 2 VISX    -    5253C 2 SVISX   -   5306C 2
TVISX   -   5341C 2 IBI     -   5374C 2 IMX     -    5375C 2 IMEF1   -   5376C 2 IMEF2   -    5377C 2 JMX     -   5400C 2
JMEF1   -   5401C 2 JMEF2   -   5402C 2 LAN     -    5403C 2 ING     -   5405C 2 INDBL   -    5407C 2 INDBR   -   5442C 2
LSBY    -   5475C 2 IEF1    -   5524C 2 IEF2    -    5557C 2 IND     -   5612C 2 AREAT   -    6767C 2 AREAU   -   6770C 2
VOLT    -   6771C 2 VOLU    -   6772C 2 AREATB  -    6773C 2 AREAUB  -   6774C 2 VOLTB   -    6775C 2 VOLUB   -   6776C 2
ATKY    -   6777C 2 EPD     -  10154C 2 DAYFR   -       0C 3 KDATFR  -      1C 3 IBFR    -       2C 3 TAIR    -      3C 3
DT      -  11600C 3 STX     -   2335C 3 STY     -    3512C 3 XYXYF   -   4667C 3 SO      -     536C 1 II      -    536C 1
TU      -    537C 1 N       -    537C 1 SLAP    -     540C 1 SLAPZ   -    540C 1 TLAP    -     541C 1 TLAPZ   -    541C 1
ULAP    -    542C 1 ULAPZ   -    542C 1 VLAP    -     543C 1 VLAPZ   -    543C 1 S1      -     544C 1 UU1     -    544C 1
S2      -    545C 1 UU2     -    545C 1 S3      -     546C 1 UU3     -    546C 1 S4      -     547C 1 UU4     -    547C 1
T1      -    550C 1 VV1     -    550C 1 T2      -     551C 1 VV2     -    551C 1 T3      -     552C 1 VV3     -    552C 1
T4      -    553C 1 VV4     -    553C 1 CSYJ    -     554C 1 CSZIJK  -    554C 1 CTYJ    -     555C 1 CTZIJK  -    555C 1
CSYJ1   -    555C 1 CSZKP1  -    556C 1 CTYJ1   -     557C 1 CTZKP1  -    557C 1 CSXJ    -     560C 1 CTXJ    -    561C 1
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JDEX    -    562C 1  IMP    -    1454     QTAV    -    1453     EMPAV  -    1452     AURD    -    1451     L        -    1450

         SUBROUTINES CALLED
OUTPTC     EXIT       QTEMPF     Q8QRSD

         COMMON BLOCKS AND LENGTHS
       -  11220      CMN1    -  14702      CMN2    -  11331     QTST    -  6063
    COMPILE TIME =     678    MILLISECS
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CARD          APPROXIMATE
NUMBER        PROGRAM LOCATION
2636               0               SUBROUTINE QTEMPF (S,T,QTX,EMPX)
2637               0         C  ========== BEGINING OF DIMENSION CHANGE  ==========                  QTEP.2
2638               0               COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,QTEP.3
2639               0              1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)QTEP.4
2640               0              2,NAMK(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LOW(4)QTEP.5
2641               0              3,LSTP(4),BG(4),DOUT(4),NDTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LOWP,  QTEP.6
2642               0              3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,QTEP.7
2643               0              3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANQTEP.8
2644               0              4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),QTEP.9
2645               0              4LGLTIJ(2,4,3),XXX(30)                                              QTEP.10
2646               0              4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, QTEP.11
2647               0              527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        QTEP.12
2648               0               COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,    QTEP.13
2649               0              1FLONG1,FLONG2,SD,TD,RDD,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   QTEP.14
2650               0              2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,QTEP.15
2651               0              3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITQTEP.16
2652               0              4(10),DZ(10),DZ4H(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  QTEP.17
2653               0              1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  QTEP.18
2654               0              5CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( QTEP.19
2655               0              727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,  QTEP.20
2656               0              8LAN(2),INC(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( QTEP.21
2657               0              923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)QTEP.22
2658               0              1,EPD(23,27)                                                        QTEP.23
2659               0               DIMENSION S(23,27),T(23,27)
2660               0         C  ********** ENDING OF DIMENSION CHANGE  ****************              QTEP.25
2661               0               EMPX=0.0                                                           QTEP.26
2662               2               DO 10 J=J1,J2
2663               2               I1=IEF1(J) $ I2=IEF2(J)                                            QTEP.28
2664               2               DO 10 I=I1,I2                                                      QTEP.29
2665               4               IF (IND(I,J) .LT. 0) GO TO 10                                      QTEP.30
2666               4               EPD(I,J)=EPD(I,J)*S(I,J)                                           QTEP.31
2667               4               EMPX=EMPX+EPD(I,J)                                                 QTEP.33
2668               4            10 CONTINUE
2669              30               EMPX=EMPX/AREATB                                                   QTEP.35
2670              30               RETURN
2671              33               END                                                                QTEP.37
                                                                                                  QTEP.38

        LENGTH OF ROUTINE   QTEMPF        46

        VARIABLE ASSIGNMENTS
S        -       0     T        -       0     QTX      -       0     EMPX     -       0     DAYS     -     0C 0  KDAT     -     1C 0
DIFDAY   -    2C 0     DTIME    -    3C 0     DAYEND   -    4C 0     MAXI     -    5C 0     IMAX     -     6C 0  JMAX     -     7C 0
KMAX     -   10C 0     IM1      -   11C 0     JM1      -   12C 0     IP1      -   13C 0     JP1      -    14C 0  I1       -    15C 0
J1       -   16C 0     I2       -   17C 0     J2       -   20C 0     I        -   21C 0     J        -    22C 0  K        -    23C 0
NCARD1   -   24C 0     NCARD    -   25C 0     KSYB     -   26C 0     INKD     -   27C 0     INDEX    -    30C 0  ITIL     -    31C 0
NAMK     -   41C 0     NTPD1    -   44C 0     NTPD2    -   45C 0     NAMT     -   46C 0     NTAP     -    62C 0  NRT      -    66C 0
KNR      -   72C 0     MWT      -   76C 0     LOW      -  102C 0     LSTP     -  106C 0     BG       -   112C 0  DOUT     -   116C 0
NDTAP    -  122C 0     ITAP     -  126C 0     MTLAB    -  132C 0     PRTDAY   -  442C 0     LOWP     -   443C 0  LPSTP    -   444C 0
LSTDA    -  445C 0     IDMDA    -  446C 0     IDMDB    -  447C 0     IDMDC    -  450C 0     IDMDD    -   451C 0  NDIM     -   452C 0
NDIM1    -  453C 0     NDIM2    -  454C 0     NDSK1    -  455C 0     NDSK2    -  456C 0     NDSK3    -   457C 0  NDSK4    -   460C 0
NDSK5    -  461C 0     NDSK6    -  462C 0     NDSK7    -  463C 0     NDSK8    -  464C 0     MSUN     -   465C 0  MSUI     -   466C 0
LMIN1    -  467C 0     LMIN2    -  470C 0     IBSCAN   -  471C 0     MSCAN    -  472C 0     EPSL     -   473C 0  ALPHAR   -   474C 0
ALPHA1   -  475C 0     PWGT     -  476C 0     DTIME1   -  477C 0     DTIME2   -  500C 0     MSWP     -   501C 0  MCOUNT   -   502C 0
MSLCT    -  503C 0     LGLTIJ   -  506C 0     XXX      -  536C 0     DAYT     -  574C 0     KDATT    -   575C 0  IBT      -   576C 0
PT       -  577C 0     KT       - 1754C 0     UT       - 1755C 0     VT       - 3132C 0     WT       -  4307C 0  ST       -  5464C 0
TT       - 6641C 0     PPT      -10016C 0     RES      -11173C 0     UTM      -12350C 0     VTM      - 13525C 0  DAYB     -     0C 1
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KDATB   -      1C 1  IMAXT   -      2C 1  NIB     -      3C 1  NIBT    -      4C 1  IUNDF   -      5C 1  RUNDF   -      6C 1
FLAT1   -      7C 1  FLAT2   -     10C 1  FLONG1  -     11C 1  FLONG2  -     12C 1  SO      -     13C 1  TO      -     14C 1
RDD     -     15C 1  ALPHA   -     16C 1  B       -     17C 1  HEATC   -     20C 1  PI      -     21C 1  RE      -     22C 1
G       -     23C 1  VISY    -     24C 1  SVISY   -     25C 1  TVISY   -     26C 1  VISZ    -     27C 1  SVISZ   -     30C 1
TVISZ   -     31C 1  POWER   -     32C 1  TAREA   -     33C 1  UAREA   -     34C 1  TVOL    -     35C 1  UVOL    -     36C 1
TKK     -     37C 1  CSTQ    -     40C 1  CSTE    -     41C 1  SECDAY  -     42C 1  DXT     -     43C 1  DXJ     -     76C 1
RDXJ2   -    131C 1  DYT     -    164C 1  DYJ     -    165C 1  RDYU2   -    166C 1  EPSSK   -    167C 1  EPSTK   -    201C 1
RLCRIT  -    213C 1  DZ      -    225C 1  DZMH    -    237C 1  Z       -    251C 1  DEPTH   -    263C 1  BETA    -    264C 1
F       -    317C 1  DG      -    352C 1  AYZT    -    364C 1  AUXY    -    376C 1  AXZT    -    431C 1  AXZJ    -   1047C 1
AX      -   1465C 1  AY      -   2103C 1  AZ      -   2521C 1  CSX     -   3137C 1  CSY     -   3555C 1  CSZ     -   4173C 1
CTX     -   4205C 1  CTY     -   4623C 1  CTZ     -   5241C 1  VISX    -   5253C 1  SVISX   -   5306C 1  TVISX   -   5341C 1
IBI     -   5374C 1  IMX     -   5375C 1  IMEF1   -   5376C 1  IMEF2   -   5377C 1  JMX     -   5400C 1  JMEF1   -   5401C 1
JMEF2   -   5402C 1  LAN     -   5403C 1  ING     -   5405C 1  INDBL   -   5407C 1  INDBR   -   5442C 1  LSBY    -   5475C 1
IEF1    -   5524C 1  IEF2    -   5557C 1  IND     -   5612C 1  AREAT   -   6767C 1  AREAU   -   6770C 1  VOLT    -   6771C 1
VOLJ    -   6772C 1  AREATB  -   6773C 1  AREAUB  -   6774C 1  VOLTB   -   6775C 1  VOLUB   -   6776C 1  ATXY    -   6777C 1
END     -  10154C 1

          SUBROUTINES CALLED
DDRSD.

          COMMON BLOCKS AND LENGTHS
CMN1    -  14702      CMN2    -  11331
    COMPILE TIME =      60    MILLISECS
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 APPROXIMATE
PROGRAM LOCATION
     0            SUBROUTINE RELAX (NDSKR,NDSKW)                                       RELX.2
     0       C  ***OVERLAP BLOCK BOUNDARY VALUE OF PPT(I,J), RES(I,J) MUST PRE-STORE  RELX.3
     0       C  ***IN BPT(J,L), BPTEP(J,L) RESPECTIVELY, BEFORE ENTER THIS ROUTINE.  RELX.4
     0       C   ******** OUTPUT PPT(I,J), RES(I,J) INCLUDING OVERLAP BLOCK BOUNDARY RELX.5
     0       C  ========== BEGINING OF DIMENSION CHANGE  ==========                  RELX.6
     0            COMMON  BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
     0           1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
     0            COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,RELX.7
     0           1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)RELX.8
     0           2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)RELX.9
     0           3,LSTP(4),BG(4),DOUT(4),NDTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LOWP,  RELX.10
     0           3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,RELX.11
     0           3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANRELX.12
     0           4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),RELX.13
     0           4LGLTIJ(2,4,3),XKK(30)                                              RELX.14
     0           4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, RELX.15
     0           627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        RELX.16
     0            DIMENSION XUVR(2484)                                                RELX.17
     0            EQUIVALENCE (PPT(1),XUVR(1))                                        RELX.18
     0            COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,     RELX.19
     0           1FLONG1,FLONG2,SD,TD,XDD,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   RELX.20
     0           2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTG,CSTE,SECDAY,RELX.21
     0           3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITRELX.22
     0           4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  RELX.23
     0           1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  RELX.24
     0           6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( RELX.25
     0           727),SVISX(27),TVISX(27),   IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   RELX.26
     0           8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( RELX.27
     0           923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)RELX.28
     0           1,EPD(23,27)
     0            DIMENSION X(2012),Y(2013)
     0            EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                  RELX.31
     0       C  ********** ENDING OF DIMENSION CHANGE  ****************              RELX.34
     0            EQUIVALENCE (XXX(1),NDKOUT),(XXX(2),NDSKRW),(XXX(3),CORR),(XXX(4),RELX.35
     0           1NSCAN),(XXX(5),ISC),(XXX(6),KCHK),(XXX(7),ICHK),(XXX(8),L),(XXX(9)RELX.36
     0           2,L1),(XXX(10),L2),(XXX(11),LSWH),(XXX(12),LI)                      RELX.37
    10            CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKR) $ CALL REWDTP (NDSKW)   RELX.38
    13      100   CALL RDBUFL (NDSK5,IDMDB,Y)                                         RELX.39
    20            CALL RDBUFL (NDSKR,IDMDC,XUVR)                                      RELX.40
    20       C    FILL IN OVERLAP-BOUNDARY VALUES OF UTM,VTM WITH BUTM,BVTM.         RELX.41
    25            LI=3                                                                RELX.42
    25            DO 112 L=1,2                                                        RELX.43
    25            LI=LI-2 $ L1=LAN(L)                                                 RELX.44
    25            IF (L1 .EQ. 0) GO TO 112                                            RELX.45
    25            L1=L1+LI $ I1=ING(L)-LI                                             RELX.46
    25            DO 111 J=1,JMAX                                                     RELX.47
    35            UTM(I1,J)=BUTM(J,L1) $ VTM(I1,J)=BVTM(J,L1)                         RELX.48
    35      111   CONTINUE                                                            RELX.49
    55      112   CONTINUE                                                            RELX.50
    55       C    ------CALCULATION THE FINAL RES(I,J) WITHOUT THE OVERLAP BOUNDARY.  RELX.51
    60            DO 150 J=J1,J2                                                      RELX.52
    60            I1=IEF1(J) $ I2=IEF2(J) $ JM1=J-1                                   RELX.53
    60            DO 150 I=I1,I2                                                      RELX.54
    65            IF (IND(I,J) .NE. 0) GO TO 150                                      RELX.55
    65            IM1=I-1                                                             RELX.56
    65            CIRCT=(VTM(IM1,J)-VTM(I,J))*RDXU2(J)+(VTM(IM1,JM1)-VTM(I,JM1))*    RELX.57
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        APPROXIMATE
     PROGRAM LOCATION
              65          IRDXJ2(JM1)+(UTM(I,J)-UTM(I,JM1)+UTM(IM1,J)-UTM(IM1,JM1))*RDYU2    RELX.58
              65          RES(I,J)=RES(I,J)+CIRCT                                            RELX.59
              65      150 CONTINUE                                                           RELX.60
              65    C *** STORE THE OVERLAP BOUNDARY VALUE OF RES IN BPTEP FOR OTHER BLOCKS.RELX.61
              65    C *** STORE THE OVERLAP BOUNDARY VALUE OF PPT IN  BPT  FOR OTHER BLOCKS.RELX.62
             136          DO 122 L=1,2                                                       RELX.63
             136          L1=LAN(L)                                                          RELX.64
             136          IF (L1 .EQ. 0) GO TO 122                                           RELX.65
             136          I1=ING(L)                                                          RELX.66
             136          DO 121 J=1,JMAX                                                    RELX.67
             147          BPT(J,L1)=PPT(I1,J) $ BPTEP(J,L1)=RES(I1,J)                        RELX.68
             147      121 CONTINUE                                                           RELX.69
             165      122 CONTINUE                                                           RELX.70
             170          CALL WTBUFL (NDSKW,IDMDC,XUVR)                                     RELX.71
             177          IF (IBI .NE. NIB) GO TO 100                                        RELX.72
             201          NSCAN=0                                                            RELX.73
             201    C  *****START---BLOCK CALCULATION OF RELAXATION *******                  RELX.74
             201        2 NSCAN=NSCAN+1                                                      RELX.75
             204        1 NDSKRW=NDSKR $ NDSKR=NDSKW $ NDSKW=NDSKRW                          RELX.76
             204        4 CONTINUE                                                           RELX.77
             215          CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKR) $ CALL REWDTP (NDSKW)    RELX.78
             221          KCHK=0                                                             RELX.79
             221        3 CALL RDBUFL (NDSK5,IDMDB,Y)                                        RELX.80
             227          CALL RDBUFL (NDSKR,IDMDC,XUVR)                                     RELX.81
             227    C  ***** FILL IN THE OVERLAP BOUNDARY VALUE OF PPT(I,J), RES(I,J) WITH   RELX.82
             227    C  ***** THIER STORE VALUES AT BPT(J,L), BPTEP(J,L)                      RELX.83
             234          LSWH=0                                                             RELX.84
             234          GO TO 17                                                           RELX.85
             234    C  ------CONTINUE CALCULATION------                                      RELX.86
             237       15 IF (NSCAN .EQ. 0) GO TO 7                                          RELX.87
             241          ISC=0                                                              RELX.88
             241       10 ISC=ISC+1                                                          RELX.89
             242          ICHK=0                                                             RELX.90
             242          DO 20 J=J1,J2                                                      RELX.91
             242          I1=IEF1(J) $ I2=IEF2(J) $ JM1=J-1 $ JP1=J+1                        RELX.92
             242          DO 20 I=I1,I2                                                      RELX.93
             254          IF (IND(I,J) .NE. 0) GO TO 20                                      RELX.94
             254          IF (ABS(RES(I,J)) .LT. EPSL) GO TO 20                              RELX.95
             254          ICHK=1 $ IM1=I-1 $ IP1=I+1                                         RELX.96
             254          CORR=ALPHA1*RES(I,J)                                               RELX.97
             254          RES(I,J)=-ALPHAR*RES(I,J) $ PPT(I,J)=PPT(I,J)+CORR                 RELX.98
             254          RES(IM1,J)=RES(IM1,J)+CORR $ RES(I,JP1)=RES(I,JP1)+CORR            RELX.99
             254          RES(IP1,J)=RES(IP1,J)+CORR $ RES(I,JM1)=RES(I,JM1)+CORR            RELX.100
             254       20 CONTINUE                                                           RELX.101
             341          IF (ICHK .EQ. 0) GO TO 30                                          RELX.102
             345          IF (ISC .LT. IBSCAN) GO TO 10                                      RELX.103
             347       30 CALL WTBUFL (NDSKW,IDMDC,XUVR)                                     RELX.104
             354          KCHK=KCHK+ICHK                                                     RELX.105
             354    C  **STORE OVERLAP BOUNDARY OF PPT(I,J),RES(I,J) AT BPT(J,L),BPTEP(J,L) RELX.106
             354          LSWH=1                                                             RELX.107
             354    C  ---FROM HERE TO STATEMENT 22 IS A GENERAL BLOCK BOUNDARY INTERCHANGE RELX.108
             354    C  ---ROUTINE WITH INPUT LSWH = (0,1)                                    RELX.109
             354       17 LI=3                                                               RELX.110
             357          DO 22 L=1,2                                                        RELX.111
             357          LI=LI-2 $ L1=LAN(L)                                                RELX.112
             357          IF (L1 .EQ. 0) GO TO 22                                            RELX.113
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CARD             APPROXIMATE
NUMBER         PROGRAM LOCATION
2784                357              I1=ING(L)                                                          RELX.114
2785                357              L2=L1+LI $ I2=I1-LI                                                RELX.115
2786                357              IF (LSWH .NE. 0) GO TO 19                                          RELX.116
2787                357              DO 18 J=1,JMAX                                                     RELX.117
2788                400              PPT(I1,J)=BPT(J,L1) $ RES(I1,J)=BPTEP(J,L1)                        RELX.118
2789                400              PPT(I2,J)=BPT(J,L2) $ RES(I2,J)=BPTEP(J,L2)                        RELX.119
2790                400         18   CONTINUE                                                           RELX.120
2791                423              GO TO 22                                                           RELX.121
2792                424         19   DO 21 J=1,JMAX                                                     RELX.122
2793                424              BPT(J,L1)=PPT(I1,J) $ BPTEP(J,L1)=RES(I1,J)                        RELX.123
2794                424              BPT(J,L2)=PPT(I2,J) $ BPTEP(J,L2)=RES(I2,J)                        RELX.124
2795                424         21   CONTINUE                                                           RELX.125
2796                450         22   CONTINUE                                                           RELX.126
2797                455              IF (LSWH .EQ. 0) GO TO 16                                          RELX.127
2798                460              IF (IBI .NE. NIB) GO TO 3                                          RELX.128
2799                463              IF (KCHK .EQ. 0) GO TO 6                                           RELX.129
2800                467              IF (NSCAN .LT. MSCAN) GO TO 2                                      RELX.130
2801                471              PRINT 5, DAYS,IBSCAN,MSCAN                                         RELX.131
2802                504          5   FORMAT (//5X,*DAYS, IBSCAN, MSCAN =*F14.4,2I5,*,  NOW NO. OF BLOCKRELX.132
2803                504             1 SCANNING EXEEDS MSCAN.*/20X,*----JOB TERMINATES ABNORMALLY----*/)RELX.133
2804                504              NAMX(2)=10HAT RELAXAT  $ NAMX(3)=10HION STOP                       RELX.134
2805                504              LTYPE=1 $ NDUM=0                                                   RELX.135
2806                504              CALL CALCKD (LTYPE,NDSKR,NDUM)                                     RELX.136
2807                515              CALL CALCKD (LTYPE,NDSKW,NDUM)                                     RELX.137
2808                523              CALL EXIT                                                          RELX.138
2809                524          6   NSCAN=0                                                            RELX.139
2810                524              GO TO 1                                                            RELX.140
2811                525          7   CALL WTBUFL (NDSKW,IDMDE,XUVR)                                     RELX.141
2812                534              IF (IBI .NE. NIB) GO TO 3                                          RELX.142
2813                536              RETURN                                                             RELX.143
2814                536              END                                                                RELX.144

          LENGTH OF ROUTINE    RELAX        606

          VARIABLE ASSIGNMENTS
NDSKR  -        0    NDSKW  -        0    XUVR   -  10016C 1  X      -      0C 2  Y      -   5374C 2  BPT    -       0C 0
BUT    -     154C 0  BVT    -    2244C 0  BST    -   4334C 0  BTT    -   6424C 0  BUTM   -  10514C 0  BVTM   -  10670C 0
BPTEP  -   11044C 0  DAYS   -       0C 1  KDAT   -      1C 1  DIFDAY -      2C 1  DTIME  -      3C 1  DAYEND -      4C 1
MAXI   -       5C 1  IMAX   -       6C 1  JMAX   -      7C 1  KMAX   -     10C 1  IM1    -     11C 1  JM1    -     12C 1
IP1    -      13C 1  JP1    -      14C 1  I1     -     15C 1  J1     -     16C 1  I2     -     17C 1  J2     -     20C 1
I      -      21C 1  J      -      22C 1  K      -     23C 1  NCARD1 -     24C 1  NCARD  -     25C 1  KSYB   -     26C 1
INKD   -      27C 1  INDEX  -      30C 1  ITIL   -     31C 1  NAMX   -     41C 1  NTP01  -     44C 1  NTP02  -     45C 1
NAMT   -      45C 1  NTAP   -      62C 1  NRT    -     66C 1  KNR    -     72C 1  MWT    -     76C 1  LDW    -    102C 1
LSTP   -     106C 1  BG     -     112C 1  DOUT   -    116C 1  NOTAP  -    122C 1  ITAP   -    126C 1  MTLAB  -    132C 1
PRTDAY -     442C 1  LDWP   -     443C 1  LPSTP  -    444C 1  LSTDA  -    445C 1  IDMDA  -    446C 1  IDMDB  -    447C 1
IDMDC  -     450C 1  IDMDD  -     451C 1  NDIM   -    452C 1  NDIM1  -    453C 1  NDIM2  -    454C 1  NDSK1  -    455C 1
NDSK2  -     456C 1  NDSK3  -     457C 1  NDSK4  -    460C 1  NDSK5  -    461C 1  NDSK6  -    462C 1  NDSK7  -    463C 1
NDSK8  -     464C 1  MSUN   -     465C 1  MSUI   -    466C 1  LMIN1  -    467C 1  LMIN2  -    470C 1  IBSCAN -    471C 1
MSCAN  -     472C 1  EPSL   -     473C 1  ALPHAR -    474C 1  ALPHA1 -    475C 1  PWGT   -    476C 1  DTIME1 -    477C 1
DTIME2 -     500C 1  MSWP   -     501C 1  MCOUNT -    502C 1  MSLCT  -    503C 1  LGLTIJ -    506C 1  XXX    -    536C 1
DAYT   -     574C 1  KDATT  -     575C 1  IBT    -    576C 1  PT     -    577C 1  KT     -   1754C 1  UT     -   1755C 1
VT     -    3132C 1  WT     -    4307C 1  ST     -   5464C 1  TT     -   6641C 1  PPT    -  10016C 1  RES    -  11173C 1
UTM    -   12350C 1  VTM    -   13525C 1  DAYB   -      0C 2  KDATB  -      1C 2  IMAXT  -      2C 2  NIB    -      3C 2
NIBT   -       4C 2  IJNDF  -       5C 2  RJNDF  -      6C 2  FLAT1  -      7C 2  FLAT2  -     10C 2  FLONG1 -     11C 2
FLONG2 -      12C 2  SO     -      13C 2  TO     -     14C 2  ROO    -     15C 2  ALPHA  -     16C 2  B      -     17C 2
HEATC  -      20C 2  PI     -      21C 2  RE     -     22C 2  G      -     23C 2  VISY   -     24C 2  SVISY  -     25C 2
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TVISY  -     26C 2  VISZ   -     27C 2  SVISZ  -     30C 2  TVISZ  -     31C 2  POWER  -     32C 2  TAREA  -     33C 2
UAREA  -     34C 2  TVOL   -     35C 2  JVOL   -     36C 2  TKK    -     37C 2  CSTQ   -     40C 2  CSTE   -     41C 2
SECDAY -     42C 2  DXT    -     43C 2  DXU    -     75C 2  RDXU2  -    131C 2  DYT    -    164C 2  DYJ    -    165C 2
RUYU2  -    166C 2  EPSSK  -    167C 2  EPSTK  -    201C 2  RDCRIT -    213C 2  DZ     -    225C 2  DZMH   -    237C 2
Z      -    251C 2  DEPTH  -    263C 2  BETA   -    264C 2  F      -    317C 2  DG     -    352C 2  AYZT   -    364C 2
AUXY   -    376C 2  AXZT   -    431C 2  AXZU   -   1047C 2  AX     -   1465C 2  AY     -   2103C 2  AZ     -   2521C 2
CSX    -   3137C 2  CSY    -   3555C 2  CSZ    -   4173C 2  CTX    -   4205C 2  CTY    -   4623C 2  CTZ    -   5241C 2
VISX   -   5253C 2  SVISX  -   5306C 2  TVISX  -   5341C 2  IBI    -   5374C 2  IMX    -   5375C 2  IMEF1  -   5376C 2
IMEF2  -   5377C 2  JMX    -   5400C 2  JMEF1  -   5401C 2  JMEF2  -   5402C 2  LAN    -   5403C 2  ING    -   5405C 2
INDBL  -   5407C 2  INDBR  -   5442C 2  LSBY   -   5475C 2  IEF1   -   5524C 2  IEF2   -   5557C 2  IND    -   5612C 2
AREAT  -   6767C 2  AREAJ  -   6770C 2  VOLT   -   6771C 2  VOLU   -   6772C 2  AREATB -   6773C 2  AREAUB -   6774C 2
VOLTB  -   6775C 2  VOLUB  -   6776C 2  ATXY   -   6777C 2  EPD    -  10154C 2  NDKOUT -    536C 1  NDSKRW -    537C 1
CORR   -    540C 1  NSCAV  -    541C 1  ISC    -    542C 1  KCHK   -    543C 1  ICHK   -    544C 1  L      -    545C 1
L1     -    546C 1  L2     -    547C 1  LSWH   -    550C 1  LI     -    551C 1  CIRCT  -    546     LTYPE  -    545
NDUM   -    544

          SUBROUTINES CALLED
REWDTP    RDBUFL    WTBUFL    OUTPTC    CALCKD    EXIT      Q8QRSD

          COMMON BLOCKS AND LENGTHS
     -  11220       CMN1    -  14702      CMN2    -  11331
    COMPILE TIME =     280    MILLISECS
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CARD       APPROXIMATE
NUMBER   PROGRAM LOCATION
2815          0            SUBROUTINE CNTX (NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)                  CNTX.2
2816          0      C ** OUTPUT OF CNTX ARE NEW ADJUSTED S, T (WITHOUT OVERLAP BOUNDARY)    CNTX.3
2817          0      C ** AND NEW DEVIATED U, V (WITHOUT OVERLAP BOUNDARY) WITHOUT SUBSTRACT CNTX.4
2818          0      C ** OF THE VERTICAL MEAN U, V, WHICH IS CONCURRENTLY CALCULATED IN THISCNTX.5
2819          0      C ** ROUTINE AND STORED IN UTM, VTM.                                    CNTX.6
2820          0      C ** AND STORE THE BOUNDARY VALUE (FOR OTHER BLOCK) OF U, V, UTM,VTM IN CNTX.7
2821          0      C ** BUT, BVT,  BUTM, BVTM RESPECTIVELY.                                CNTX.8
2822          0      C  ========== BEGINING OF DIMENSION CHANGE  ==========                  CNTX.9
2823          0            COMMON  BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
2824          0           1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
2825          0            COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,CNTX.10
2826          0           1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)CNTX.11
2827          0           2,NAMX(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LOW(4)CNTX.12
2828          0           3,LSTP(4),RG(4),OOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LOWP,  CNTX.13
2829          0           3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,CNTX.14
2830          0           3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANCNTX.15
2831          0           4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),CNTX.16
2832          0           4LGLTIJ(2,4,3),XXX(30)                                             CNTX.17
2833          0           4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, CNTX.18
2834          0           627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        CNTX.19
2835          0            DIMENSION KJVR(2484)                                              CNTX.20
2836          0            EQUIVALENCE (PPT(1),KJVR(1))                                      CNTX.21
2837          0            DIMENSION BT(624),DT(3106)                                        CNTX.22
2838          0            EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                               CNTX.23
2839          0            COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,    CNTX.24
2840          0           1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   CNTX.25
2841          0           2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,CNTX.26
2842          0           3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITCNTX.27
2843          0           4(10),DZ(10),DZ4H(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  CNTX.28
2844          0           1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  CNTX.29
2845          0           5CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( CNTX.30
2846          0           727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,  CNTX.31
2847          0           8LAN(2),INC(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( CNTX.32
2848          0           923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)CNTX.33
2849          0           1,EPD(23,27)
2850          0            DIMENSION X(2812),Y(2013)
2851          0            EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                CNTX.36
2852          0            COMMON/CMN3/BP(624),DA(3106),DB(3106),DC(3106)                    CNTX.37
2853          0            DIMENSION P(23,27)                                                CNTX.38
2854          0            DIMENSION UA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)       CNTX.39
2855          0            DIMENSION UB(23,27),VB(23,27),WB(23,27),SB(23,27),TB(23,27)       CNTX.40
2856          0            DIMENSION UC(23,27),VC(23,27),WC(23,27),SC(23,27),TC(23,27)       CNTX.41
2857          0            EQUIVALENCE (BP(1),DAYX),(BP(2),KDATX),(BP(3),IB),(BP(4),P(1))    CNTX.42
2858          0            EQUIVALENCE (DA(1),KA),(DA(2),UA(1)),(DA(623),VA(1)),(DA(1244),WA(CNTX.43
2859          0           11)),(DA(1865),SA(1)),(DA(2486),TA(1))                             CNTX.44
2860          0            EQUIVALENCE (DB(1),KB),(DB(2),UB(1)),(DB(623),VB(1)),(DB(1244),WB(CNTX.45
2861          0           11)),(DB(1865),SB(1)),(DB(2486),TB(1))                             CNTX.46
2862          0            EQUIVALENCE (DC(1),KC),(DC(2),UC(1)),(DC(623),VC(1)),(DC(1244),WC(CNTX.47
2863          0           11)),(DC(1865),SC(1)),(DC(2486),TC(1))                             CNTX.48
2864          0            DIMENSION INDB(27,2),UBAR(23,27),VBAR(23,27)                      CNTX.51
2865          0            COMMON/QTST/DAYFR,KDATFR,IBFR,TAIR(23,27),QT(23,27),STX(23,27),
2866          0           1STY(23,27), IDMQT,IDMF2,IDMF4,LCMFR(65),LCMFRQ,NORDER,PERIOD,MAXFR
2867          0           1,RPERD(2),KIND2,KIND4,CAG1,CAG2,CRB1,CRB2,BB2,BB12,AA2,AA12,BVPT,
2868          0           1BV2,CI2,CI3,CB2,CB3,CB4,CH1,CE1,CTX1,DAYSC,XABF(541)
2869          0      C  ********** ENDING OF DIMENSION CHANGE  ****************               CNTX.52
2870          0            EQUIVALENCE (INDBL(1),INDB(1))                                    CNTX.53
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CARD           APPROXIMATE
NUMBER       PROGRAM LOCATION
2871              0              EQUIVALENCE (STX(1),UBAR(1)),(STY(1),VBAR(1))                        CNTX.54
2872             10              CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKX) $ CALL REWDTP (NDSKZ)      CNTX.55
2873             21              CALL REWDTP (NDSKY) $ CALL REWDTP (NDSKR) $ CALL REWDTP (NDSKW)      CNTX.56
2874             24           10 CALL RDBUFL(NDSK5,IDMDB,Y)                                           CNTX.57
2875             31              CALL RDBUFL (NDSKX,NDIM1,BP)                                         CNTX.58
2876             35              CALL RDBUFL (NDSKY,NDIM1,BT)                                         CNTX.59
2877             43              CALL RDBUFL (NDSKR,IDMDC,XUVR)                                       CNTX.60
2878             50              DAYX=DAYT $ KDATX=KDATT                                              CNTX.61
2879             50         C  CALCULATION OF VERTICAL AVERAGE OF OLD U, V (UBAR, VBAR) FORM INPUT    CNTX.62
2880             50         C   OLD P (NOT INCLUDING OVERLAP BOUNDARY POINTS)                         CNTX.63
2881             50         C  ----- AND STORE IN THE LOCATION OF STX AND STY RESPECTIVELY.           CNTX.64
2882             50         C    RDYU2=0.5/DYU   $    RDXU2(J)=0.5/DXU(J)                             CNTX.65
2883             50              DO 12  J=J1,J2                                                       CNTX.66
2884             50              I1=IEF1(J) $ I2=IEF2(J) $ JP1=J+1                                    CNTX.67
2885             50              DO 12 I=I1,I2                                                        CNTX.68
2886             54              IF (IND(I,J) .LT. 0 .OR. IND(I,J) .GT. 6) GO TO 12                   CNTX.69
2887             54              IP1=I+1                                                              CNTX.70
2888             54              UBAR(I,J)=(P(I,J)+P(IP1,J)-P(I,JP1)-P(IP1,JP1))*RDYU2                CNTX.71
2889             54              VBAR(I,J)=(P(IP1,J)+P(IP1,JP1)-P(I,J)-P(I,JP1))*RDXU2(J)             CNTX.72
2890             54           12 CONTINUE                                                             CNTX.73
2891             54         C **** CALCULATION OF ADVANCING STREAM FUNCTION P(I,J) OF BLOCK IB        CNTX.74
2892             54         C    ----HERE NEW P(I,J) IN LOCATION OF PT(I,J), OLD P(I,J) IN P(I,J)     CNTX.75
2893             54         C    ----THE REAL PT(I,J) IS IN THE LOCATION OF PPT(I,J) FROM DISK NDSKR.CNTX.76
2894             54         C    ----ALL  INPUT P(I,J), PPT(I,J) AND OUTPUT PT(I,J) (THE NEW P(I,J)   CNTX.77
2895             54         C    ----ARE INCLUDING THIER OVERLAP BOUNDARY VALUES.                     CNTX.78
2896             54         C  ADVANCE OF STREAM FUNCTION P(I,J) OF BLOCK IB (NOT INCLUDING OVERLAP)CNTX.79
2897            130              DO 15 J=J1,J2                                                        CNTX.80
2898            130              I1=IEF1(J) $ I2=IEF2(J)                                              CNTX.81
2899            130              DO 15 I=I1,I2                                                        CNTX.82
2900            131              IF (IND(I,J) .LT. 0) GO TO 15                                        CNTX.83
2901            131              PT(I,J)=P(I,J)+DTIME*PPT(I,J)                                        CNTX.84
2902            131           15 CONTINUE                                                             CNTX.85
2903            131         C    ********ADVANCE P AT THE OVERLAP BOUNDARY********                    CNTX.86
2904            157              IL=3                                                                 CNTX.87
2905            157              DO 18 L=1,2                                                          CNTX.88
2906            157              IL=IL-2 $ I=ING(L)                                                   CNTX.89
2907            157              IF (I .EQ. 0) GO TO 18                                               CNTX.90
2908            157              I=I-IL                                                               CNTX.91
2909            157              DO 17 J=1,JMAX                                                       CNTX.92
2910            171              IF (INDB(J,L) .LT. 0) GO TO 17                                       CNTX.93
2911            171              PT(I,J)=P(I,J)+DTIME*PPT(I,J)                                        CNTX.94
2912            171           17 CONTINUE                                                             CNTX.95
2913            213           18 CONTINUE                                                             CNTX.96
2914            213         C  *** STORE IN BPTEP(J,IB-1), THE SPECIAL BOUNDARY OF NEW P(I,J) (WHICHCNTX.97
2915            213         C  *** HAS THE LOCATION OF PT(I,J)) FOR FUTURE USE IN ROUTINE WUVCAL.     CNTX.98
2916            213         C  *** WHERE I=ING(1)+1 FOR ING(1) .NE. 0                                 CNTX.99
2917            217              IF (ING(1) .EQ. 0) GO TO 24                                          CNTX.100
2918            222              I=ING(1)+1 $ IBM1=IB-1                                               CNTX.101
2919            222              DO 23 J=1,JMAX                                                       CNTX.102
2920            222           23 BPTEP(J,IBM1)=PT(I,J)                                                CNTX.103
2921            222         C  --- ZERO OUT UTM(I,J), VTM(I,J) ---                                    CNTX.104
2922            241           24 DO 16 J=J1,J2                                                        CNTX.105
2923            241              I1=IEF1(J) $ I2=IEF2(J)                                              CNTX.106
2924            241              DO 16 I=I1,I2                                                        CNTX.107
2925            243              IF (IND(I,J) .LT. 0 .OR. IND(I,J) .GT. 6) GO TO 16                   CNTX.108
2926            243              UTM(I,J)=VTM(I,J)=0.0                                                CNTX.109
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APPROXIMATE
PROGRAM LOCATION
      243    16 CONTINUE                                                  CNTX.110
      272       CALL WTBUFL (NDSKZ,NDIM1,BT)                              CNTX.111
      300       CALL RDBUFL (NDSKX,NDIM2,DA)                              CNTX.112
      305       CALL RDBUFL (NDSKY,NDIM2,DT)                              CNTX.113
      312       CALL ADVCD (DAYX,IB,KA,UA,VA,SA,TA)                       CNTX.114
      323       CALL RDBUFL (NDSKX,NDIM2,DB)                              CNTX.115
      330       CALL RDBUFL (NDSKY,NDIM2,DT)                              CNTX.116
      335       CALL ADVCD (DAYX,IB,KB,UB,VB,SB,TB)                       CNTX.117
      346    20 CALL RDBUFL (NDSKX,NDIM2,DC)                              CNTX.118
      353       CALL RDBUFL (NDSKY,NDIM2,DT)                              CNTX.119
      360       CALL ADVCD (DAYX,IB,KC,UC,VC,SC,TC)                       CNTX.120
      371       CALL CALCAJ (DAYX,IB,KA,SA,TA,KB,SB,TB,KC,SC,TC)          CNTX.121
      406       CALL WTBUFL (NDSKZ,NDIM2,DA)                              CNTX.122
      415       IF (KC .LT. KMAX) GO TO 21                                CNTX.123
      417       CALL WTBUFL (NDSKZ,NDIM2,DB)                              CNTX.124
      424       CALL WTBUFL (NDSKZ,NDIM2,DC)                              CNTX.125
      431       GO TO 50                                                  CNTX.126
      431    21 CALL RDBUFL (NDSKX,NDIM2,DA)                              CNTX.127
      437       CALL RDBUFL (NDSKY,NDIM2,DT)                              CNTX.128
      444       CALL ADVCD (DAYX,IB,KA,UA,VA,SA,TA)                       CNTX.129
      455       CALL CALCAJ (DAYX,IB,KB,SB,TB,KC,SC,TC,KA,SA,TA)          CNTX.130
      472       CALL WTBUFL (NDSKZ,NDIM2,DB)                              CNTX.131
      501       IF (KA .LT. KMAX) GO TO 22                                CNTX.132
      503       CALL WTBUFL (NDSKZ,NDIM2,DC)                              CNTX.133
      510       CALL WTBUFL (NDSKZ,NDIM2,DA)                              CNTX.134
      515       GO TO 50                                                  CNTX.135
      515    22 CALL RDBUFL (NDSKX,NDIM2,DB)                              CNTX.136
      523       CALL RDBUFL (NDSKY,NDIM2,DT)                              CNTX.137
      530       CALL ADVCD (DAYX,IB,KB,UB,VB,SB,TB)                       CNTX.138
      541       CALL CALCAJ (DAYX,IB,KC,SC,TC,KA,SA,TA,KB,SB,TB)          CNTX.139
      555       CALL WTBUFL (NDSKZ,NDIM2,DC)                              CNTX.140
      565       IF (KB .LT. KMAX) GO TO 20                                CNTX.141
      567       CALL WTBUFL (NDSKZ,NDIM2,DA)                              CNTX.142
      574       CALL WTBUFL (NDSKZ,NDIM2,DB)                              CNTX.143
      574   C ----THINGS CHANGED IN XJVR ARE UTM, VTM----                 CNTX.144
      601    50 CALL WTBUFL (NDSKW,IDMDC,XUVR)                            CNTX.145
      610       IF (IB .LT. NIB) GO TO 10                                 CNTX.146
      612       RETURN                                                    CNTX.147
      612       END                                                       CNTX.148

      LENGTH OF ROUTINE   CNTX        662

      VARIABLE ASSIGNMENTS
NDSKX  -       0    NDSKY  -       0    NDSKZ  -       0    NDSKR  -       0    NDSKW  -       0    XUVR   -  10016C 1
BT     -    574C 1  DT     -   1754C 1  X      -      0C 2  Y      -   5374C 2  P      -      3C 3  UA     -   1161C 3
VA     -   2335C 3  WA     -   3513C 3  SA     -   4670C 3  TA     -   6045C 3  UB     -   7223C 3  VB     -  10400C 3
WB     -  11555C 3  SB     -  12732C 3  TB     -  14107C 3  UC     -  15265C 3  VC     -  16442C 3  WC     -  17617C 3
SC     -  20774C 3  TC     -  22151C 3  INDB   -   5407C 2  UBAR   -   2335C 4  VBAR   -   3512C 4  BPT    -      0C 0
BUT    -    154C 0  BVT    -   2244C 0  BST    -   4334C 0  BTT    -   6424C 0  BUTM   - 10514C 0   BVTM   -  10670C 0
BPTEP  -  11044C 0  DAYS   -      0C 1  KDAT   -      1C 1  DIFDAY -      2C 1  DTIME  -      3C 1  DAYEND -      4C 1
MAXI   -      5C 1  IMAX   -      6C 1  JMAX   -      7C 1  KMAX   -     10C 1  IM1    -     11C 1  JM1    -     12C 1
IP1    -     13C 1  JP1    -     14C 1  I1     -     15C 1  J1     -     16C 1  I2     -     17C 1  J2     -     20C 1
I      -     21C 1  J      -     22C 1  K      -     23C 1  NCARD1 -     24C 1  NCARD  -     25C 1  KSYB   -     26C 1
INKD   -     27C 1  INDEX  -     30C 1  ITIL   -     31C 1  NAMX   -     41C 1  NTPD1  -     44C 1  NTPD2  -     45C 1
NAMT   -     46C 1  NTAP   -     62C 1  NRT    -     66C 1  KNR    -     72C 1  MWT    -     76C 1  LDW    -    102C 1
LSTP   -    106C 1  BG     -    112C 1  DOUT   -    116C 1  NDTAP  -    122C 1  ITAP   -    126C 1  MTLAB  -    132C 1
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PRTDAY -    442C 1  LOWP   -    443C 1  LPSTP  -    444C 1  LSTDA  -    445C 1  IDMDA  -    446C 1  IDMDB  -    447C 1
IDMDC  -    450C 1  IDMDD  -    451C 1  NDIM   -    452C 1  NDIM1  -    453C 1  NDIM2  -    454C 1  NDSK1  -    455C 1
NDSK2  -    456C 1  NDSK3  -    457C 1  NDSK4  -    460C 1  NDSK5  -    461C 1  NDSK6  -    462C 1  NDSK7  -    463C 1
NDSK8  -    464C 1  MSUN   -    465C 1  MSUI   -    466C 1  LMIN1  -    467C 1  LMIN2  -    470C 1  IBSCAN -    471C 1
MSCAN  -    472C 1  EPSL   -    473C 1  ALPHAR -    474C 1  ALPHA1 -    475C 1  PWGT   -    476C 1  DTIME1 -    477C 1
DTIME2 -    500C 1  MSWP   -    501C 1  MCOUNT -    502C 1  MSLCT  -    503C 1  LGLTIJ -    506C 1  XXX    -    536C 1
DAYT   -    574C 1  KDATT  -    575C 1  IBT    -    576C 1  PT     -    577C 1  KT     -   1754C 1  UT     -   1755C 1
VT     -   3132C 1  WT     -   4307C 1  ST     -   5464C 1  TT     -   6641C 1  PPT    -  10016C 1  RES    -  11173C 1
UTM    - 12350C 1  VTM    -  13525C 1  DAYB   -      0C 2  KDATB  -      1C 2  IMAXT  -      2C 2  NIB    -      3C 2
NIBT   -      4C 2  IUNDF  -      5C 2  RUNDF  -      6C 2  FLAT1  -      7C 2  FLAT2  -     10C 2  FLONG1 -     11C 2
FLONG2 -     12C 2  SO     -     13C 2  TO     -     14C 2  ROO    -     15C 2  ALPHA  -     16C 2  B      -     17C 2
HEATC  -     20C 2  PI     -     21C 2  RE     -     22C 2  G      -     23C 2  VISY   -     24C 2  SVISY  -     25C 2
TVISY  -     26C 2  VISZ   -     27C 2  SVISZ  -     30C 2  TVISZ  -     31C 2  POWER  -     32C 2  TAREA  -     33C 2
UAREA  -     34C 2  TVOL   -     35C 2  UVOL   -     36C 2  TKK    -     37C 2  CSTQ   -     40C 2  CSTE   -     41C 2
SECDAY -     42C 2  DXT    -     43C 2  DXU    -     76C 2  RDXU2  -    131C 2  DYT    -    164C 2  DYJ    -    165C 2
RDYJ2  -    166C 2  EPSSK  -    167C 2  EPSTK  -    201C 2  ROCRIT -    213C 2  DZ     -    225C 2  DZMH   -    237C 2
Z      -    251C 2  DEPTH  -    263C 2  BETA   -    264C 2  F      -    317C 2  DG     -    352C 2  AYZT   -    364C 2
AUXY   -    376C 2  AXZT   -    431C 2  AXZU   -   1047C 2  AX     -   1465C 2  AY     -   2103C 2  AZ     -   2521C 2
CSX    -   3137C 2  CSY    -   3555C 2  CSZ    -   4173C 2  CTX    -   4205C 2  CTY    -   4623C 2  CTZ    -   5241C 2
VISX   -   5253C 2  SVISX  -   5306C 2  TVISX  -   5341C 2  IBI    -   5374C 2  IMX    -   5375C 2  IMEF1  -   5376C 2
IMEF2  -   5377C 2  JMX    -   5400C 2  JMEF1  -   5401C 2  JMEF2  -   5402C 2  LAN    -   5403C 2  ING    -   5405C 2
INDBL  -   5407C 2  INDBR  -   5442C 2  LSBY   -   5475C 2  IEF1   -   5524C 2  IEF2   -   5557C 2  IND    -   5612C 2
AREAT  -   6767C 2  AREAJ  -   6770C 2  VOLT   -   6771C 2  VOLU   -   6772C 2  AREATB -   6773C 2  AREAUB -   6774C 2
VOLTB  -   6775C 2  VOLUB  -   6776C 2  ATXY   -   6777C 2  EPD    -  10154C 2  BP     -      0C 3  DA     -   1160C 3
DB     -   7222C 3  DC     -  15264C 3  DAYFR  -      0C 4  KDATFR -      1C 4  IBFR   -      2C 4  TAIR   -      3C 4
QT     -   1160C 4  STX    -   2335C 4  STY    -   3512C 4  IDMQT  -   4667C 4  IDMF2  -   4670C 4  IDMF4  -   4671C 4
LCMFR  -   4672C 4  LCMFRO -   4773C 4  NORDER -   4774C 4  PERIOD -   4775C 4  MAXFR  -   4776C 4  RPERD  -   4777C 4
KIND2  -   5001C 4  KIND4  -   5002C 4  CAG1   -   5003C 4  CAG2   -   5004C 4  CRB1   -   5005C 4  CRB2   -   5006C 4
RB2    -   5007C 4  B312   -   5010C 4  AA2    -   5011C 4  AA12   -   5012C 4  BVPT   -   5013C 4  BV2    -   5014C 4
CI2    -   5015C 4  CI3    -   5016C 4  CB2    -   5017C 4  CB3    -   5020C 4  CB4    -   5021C 4  CH1    -   5022C 4
CE1    -   5023C 4  CTX1   -   5024C 4  DAYSC  -   5025C 4  XABF   -   5026C 4  DAYX   -      0C 3  KDATX  -      1C 3
IB     -      2C 3  KA     -   1160C 3  KB     -   7222C 3  KC     -  15264C 3  IL     -    622    L      -    621
IBM1   -    620

        SUBROUTINES CALLED
REWDTP   RDBUFL    WTBUFL    ADVCD     CALCAJ    DBQRSD

        COMMON BLOCKS AND LENGTHS
     -  11220     CMN1   -  14702     CMN2   -  11331     CMN3   -  23326     QTST   -  6063
  COMPILE TIME =    272    MILLISECS
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CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
2966                    0              SUBROUTINE ADVCO (DAYX,IB,KB,U,V,S,T)                                    ADVC.2
2967                    0         C  ========== BEGINING OF DIMENSION CHANGE  ==========                        ADVC.3
2968                    0              COMMON   BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
2969                    0             1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
2970                    0              COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,ADVC.4
2971                    0             1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)ADVC.5
2972                    0             2,NAMX(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)ADVC.6
2973                    0             3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LOWP,  ADVC.7
2974                    0             3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,ADVC.8
2975                    0             3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANADVC.9
2976                    0             4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),ADVC.10
2977                    0             4LGLTIJ(2,4,3),XXX(30)                                                    ADVC.11
2978                    0             4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, ADVC.12
2979                    0             527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        ADVC.13
2980                    0              DIMENSION XUVR(2484)                                                      ADVC.14
2981                    0              EQUIVALENCE (PPT(1),XUVR(1))                                              ADVC.15
2982                    0              DIMENSION BT(624),DT(3106)                                                ADVC.16
2983                    0              EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                                       ADVC.17
2984                    0              COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,           ADVC.18
2985                    0             1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,          ADVC.19
2986                    0             2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,ADVC.20
2987                    0             3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITADVC.21
2988                    0             4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  ADVC.22
2989                    0             1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  ADVC.23
2990                    0             6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( ADVC.24
2991                    0             727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,  ADVC.25
2992                    0             8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( ADVC.26
2993                    0             923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)ADVC.27
2994                    0             1,EPD(23,27)
2995                    0              DIMENSION U(23,27),V(23,27),S(23,27),T(23,27)                            ADVC.31
2996                    0              DIMENSION UBAR(23,27),VBAR(23,27)                                         ADVC.32
2997                    0              COMMON/QTST/DAYFR,KDATFR,IBFR,TAIR(23,27),QT(23,27),STX(23,27),
2998                    0             1STY(23,27), IDMQT,IDMF2,IDMF4,LCMFR(65),LCMFRD,NORDER,PERIOD,MAXFR
2999                    0             1,RPERD(2),KIND2,KIND4,CAG1,CAG2,CRB1,CRB2,BB2,BB12,AA2,AA12,BVPT,
3000                    0             1BV2,C12,C13,CB2,CB3,CB4,CH1,CE1,CTX1,DAYSC,XABF(541)
3001                    0         C  ********** ENDING OF DIMENSION CHANGE  ****************                    ADVC.33
3002                    0              EQUIVALENCE (XXX(1),BTIM),(XXX(2),STIM),(XXX(3),UTIM),(XXX(4),           ADVC.34
3003                    0             1COEAF),(XXX(5),AFJ),(XXX(6),BFJ),(XXX(7),AFX2),(XXX(8),US1),(XXX( ADVC.35
3004                    0             29),US2),(XXX(10),VS1),(XXX(11),VS2),(XXX(12),L),(XXX(13),L1)         ADVC.36
3005                    0              EQUIVALENCE (STX(1),UBAR(1)),(STY(1),VBAR(1))                            ADVC.37
3006                    0              DATA COEA/0.55/                                                           ADVC.38
3007                    0         C    CHANGE INPUT U, V INTO U, V DEVIATED FROM VERTICAL MEAN.                 ADVC.39
3008                    0              DO 15 J=J1,J2                                                             ADVC.40
3009                    3              I1=IEF1(J) $ I2=IEF2(J)                                                   ADVC.41
3010                    3              DO 15 I=I1,I2                                                             ADVC.42
3011                    4              IF (IND(I,J) .LT. 0 .OR. IND(I,J) .GT. 6) GO TO 15                       ADVC.43
3012                    4              U(I,J)=U(I,J)-UBAR(I,J) $ V(I,J)=V(I,J)-VBAR(I,J)                        ADVC.44
3013                    4          15  CONTINUE                                                                 ADVC.45
3014                    4         C    ADVANCE OF U,V,S,T  (NOT INCLUDING BLOCK BOUNDARY)                       ADVC.46
3015                   36              BTIM=DTIME/DZ(KB)                                                         ADVC.47
3016                   36              DO 50 J=J1,J2                                                             ADVC.48
3017                   36              I1=IEF1(J) $ I2=IEF2(J)                                                   ADVC.49
3018                   36              IF (J .NE. JMAX) UTIM=BTIM/AUXY(J)                                        ADVC.50
3019                   36              COEAF=COEA*F(J) $ AFJ=COEAF*DTIME $ BFJ=(F(J)-COEAF)*DTIME               ADVC.51
3020                   36              AFX2=1.0+AFJ*AFJ                                                          ADVC.52
3021                   36              DO 50 I=I1,I2                                                             ADVC.53
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CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
3022                  54          IF (IND(I,J) .LT. 0) GO TO 50                                  ADVC.54
3023                  54          STIM=BTIM /ATXY(I,J)                                           ADVC.55
3024                  54          S(I,J)=S(I,J)+STIM*ST(I,J) $ T(I,J)=T(I,J)+STIM*TT(I,J)        ADVC.56
3025                  54          IF (IND(I,J) .GT. 6) GO TO 50                                  ADVC.57
3026                  54          US1=U(I,J)+UTIM*UT(I,J) $ VS1=V(I,J)+UTIM*VT(I,J)              ADVC.58
3027                  54          US2=US1+BFJ*V(I,J) $ VS2=VS1-BFJ*U(I,J)                        ADVC.59
3028                  54          U(I,J)=(US2+AFJ*VS2)/AFX2 $ V(I,J)=(VS2-AFJ*US2)/AFX2          ADVC.60
3029                  54          UTM(I,J)=UTM(I,J)+U(I,J)*DZ(KB) $ VTM(I,J)=VTM(I,J)+V(I,J)*DZ(KB) ADVC.61
3030                  54       50 CONTINUE                                                       ADVC.62
3031                 144          IF (KB .EQ. KMAX) GO TO 20                                     ADVC.63
3032                 144    C  -----FOR KB .NE. KMAX, STORE OVERLAP BOUNDARY OF U,V IN BUT,BVT.  ADVC.64
3033                 145          DO 19 L=1,2                                                    ADVC.65
3034                 146          L1=LAN(L)                                                      ADVC.66
3035                 145          IF (L1 .EQ. 0) GO TO 19                                        ADVC.67
3036                 146          I1=INS(L)                                                      ADVC.68
3037                 146          DO 18 J=1,JMAX                                                 ADVC.69
3038                 154          BUT(J,L1,KB)=U(I1,J) $ BVT(J,L1,KB)=V(I1,J)                    ADVC.70
3039                 154       18 CONTINUE                                                       ADVC.71
3040                 175       19 CONTINUE                                                       ADVC.72
3041                 200          RETURN                                                         ADVC.73
3042                 200    C  ------FOR KB=KMAX                                                 ADVC.74
3043                 200    C   VERTICAL AVERAGE OF DEVIATED U, V, I.E. UTM=UTM/DEPTH,VTM=VTM/DEPTH ADVC.75
3044                 201       20 DO 25 J=J1,J2                                                  ADVC.76
3045                 201          I1=IEF1(J) $ I2=IEF2(J)                                        ADVC.77
3046                 201          DO 25 I=I1,I2                                                  ADVC.78
3047                 205          IF (IND(I,J) .LT. 0 .OR. IND(I,J) .GT. 6) GO TO 25             ADVC.79
3048                 206          UTM(I,J)=UTM(I,J)/DEPTH $ VTM(I,J)=VTM(I,J)/DEPTH              ADVC.80
3049                 205       25 CONTINUE                                                       ADVC.81
3050                 206    C  -----STORE OVERLAP BOUNDARY OF U,V,UTM,VTM IN BUT,BVT,BUTM,BVTM.  ADVC.82
3051                 234          DO 22 L=1,2                                                    ADVC.83
3052                 234          L1=LAN(L)                                                      ADVC.84
3053                 234          IF (L1 .EQ. 0) GO TO 22                                        ADVC.85
3054                 234          I1=INS(L)                                                      ADVC.86
3055                 234          DO 21 J=1,JMAX                                                 ADVC.87
3056                 245          BUT(J,L1,KB)=U(I1,J) $ BUTM(J,L1)=UTM(I1,J)                    ADVC.88
3057                 245          BVT(J,L1,KB)=V(I1,J) $ BVTM(J,L1)=VTM(I1,J)                    ADVC.89
3058                 245       21 CONTINUE                                                       ADVC.90
3059                 271       22 CONTINUE                                                       ADVC.91
3060                 274          RETURN                                                         ADVC.92
3061                 275          END                                                            ADVC.93

          LENGTH OF ROUTINE   ADVC3        330

          VARIABLE ASSIGNMENTS
DAYX    -        0   IB      -        0   KB     -        0   U      -        0   V      -        0   S      -        0
T       -        0   XUVR    -  10016C 1  BT     -    574C 1  DT     -   1754C 1  UBAR   -   2335C 3  VBAR   -   3512C 3
BPT     -      0C 0  BUT     -    154C 0  BVT    -   2244C 0  BST    -   4334C 0  BTT    -   6424C 0  BUTM   -  10514C 0
BVTM    -  10670C 0  BPTEP   -  11044C 0  DAYS   -      0C 1  KDAT   -      1C 1  DIFDAY -      2C 1  DTIME  -      3C 1
DAYEND  -      4C 1  MAXI    -      5C 1  IMAX   -      6C 1  JMAX   -      7C 1  KMAX   -     10C 1  IM1    -     11C 1
JM1     -     12C 1  IP1     -     13C 1  JP1    -     14C 1  I1     -     15C 1  J1     -     16C 1  I2     -     17C 1
J2      -     20C 1  I       -     21C 1  J      -     22C 1  K      -     23C 1  NCARD1 -     24C 1  NCARD  -     25C 1
KSYB    -     26C 1  INKD    -     27C 1  INDEX  -     30C 1  ITIL   -     31C 1  NAMX   -     41C 1  NTPO1  -     44C 1
NTPO2   -     45C 1  NAMT    -     46C 1  NTAP   -     62C 1  NRT    -     66C 1  KNR    -     72C 1  MWT    -     76C 1
LOW     -    102C 1  LSTP    -    106C 1  BG     -    112C 1  DOUT   -    116C 1  NOTAP  -    122C 1  ITAP   -    126C 1
MTLAS   -    132C 1  PRTDAY  -    442C 1  LOWP   -    443C 1  LPSTP  -    444C 1  LSTDA  -    445C 1  IDMDA  -    446C 1
IDMDB   -    447C 1  IDMDC   -    450C 1  IDMDD  -    451C 1  NDIM   -    452C 1  NDIM1  -    453C 1  NDIM2  -    454C 1
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NDSK1   -     455C 1  NDSK2   -     456C 1  NDSK3   -     457C 1  NDSK4   -     460C 1  NDSK5   -     461C 1  NDSK6   -     462C 1
NDSK7   -     463C 1  NDSK8   -     464C 1  MSUN    -     465C 1  MSUI    -     466C 1  LMIN1   -     467C 1  LMIN2   -     470C 1
IBSCAN  -     471C 1  MSCAN   -     472C 1  EPSL    -     473C 1  ALPHAR  -     474C 1  ALPHA1  -     475C 1  PWGT    -     476C 1
DTIME1  -     477C 1  DTIME2  -     500C 1  MSWP    -     501C 1  MCOUNT  -     502C 1  MSLCT   -     503C 1  LGLTIJ  -     506C 1
XXX     -     536C 1  DAYT    -     574C 1  KDATT   -     575C 1  IBT     -     576C 1  PT      -     577C 1  KT      -    1754C 1
UT      -    1755C 1  VT      -    3132C 1  WT      -    4307C 1  ST      -    5464C 1  TT      -    6641C 1  PPT     -   10016C 1
RES     -   11173C 1  UTM     -   12350C 1  VTM     -   13525C 1  DAYB    -       0C 2  KDATB   -       1C 2  IMAXT   -       2C 2
NIB     -       3C 2  NIBT    -       4C 2  IUNDF   -       5C 2  RUNDF   -       6C 2  FLAT1   -       7C 2  FLAT2   -      10C 2
FLONG1  -      11C 2  FLONG2  -      12C 2  SO      -      13C 2  TO      -      14C 2  ROO     -      15C 2  ALPHA   -      16C 2
B       -      17C 2  HEATC   -      20C 2  PI      -      21C 2  RE      -      22C 2  G       -      23C 2  VISY    -      24C 2
SVISY   -      25C 2  TVISY   -      26C 2  VISZ    -      27C 2  SVISZ   -      30C 2  TVISZ   -      31C 2  POWER   -      32C 2
TAREA   -      33C 2  UAREA   -      34C 2  TVOL    -      35C 2  UVOL    -      36C 2  TKK     -      37C 2  CSTQ    -      40C 2
CSTE    -      41C 2  SECDAY  -      42C 2  DXT     -      43C 2  DXU     -      76C 2  RDXU2   -     131C 2  DYT     -     164C 2
DYU     -     165C 2  RDYU2   -     166C 2  EPSSK   -     167C 2  EPSTK   -     201C 2  ROCRIT  -     213C 2  DZ      -     225C 2
DZMH    -     237C 2  Z       -     251C 2  DEPTH   -     263C 2  BETA    -     264C 2  F       -     317C 2  DG      -     352C 2
AYZT    -     364C 2  AUXY    -     376C 2  AXZT    -     431C 2  AXZU    -    1047C 2  AX      -    1465C 2  AY      -    2103C 2
AZ      -    2521C 2  CSX     -    3137C 2  CSY     -    3555C 2  CSZ     -    4173C 2  CTX     -    4205C 2  CTY     -    4623C 2
CTZ     -    5241C 2  VISX    -    5253C 2  SVISX   -    5306C 2  TVISX   -    5341C 2  IBI     -    5374C 2  IMX     -    5375C 2
IMEF1   -    5376C 2  IMEF2   -    5377C 2  JMX     -    5400C 2  JMEF1   -    5401C 2  JMEF2   -    5402C 2  LAN     -    5403C 2
ING     -    5405C 2  INDBL   -    5407C 2  INDBR   -    5442C 2  LSBY    -    5475C 2  IEF1    -    5524C 2  IEF2    -    5557C 2
IND     -    5612C 2  AREAT   -    6767C 2  AREAU   -    6770C 2  VOLT    -    6771C 2  VOLU    -    6772C 2  AREATB  -    6773C 2
AREAUB  -    6774C 2  VOLTB   -    6775C 2  VOLUB   -    6776C 2  ATXY    -    6777C 2  EPD     -   10154C 2  DAYFR   -       0C 3
KDATFR  -       1C 3  IBFR    -       2C 3  TAIR    -       3C 3  QT      -    1160C 3  STX     -    2335C 3  STY     -    3512C 3
IDMDT   -    4667C 3  IDMF2   -    4670C 3  IDMF4   -    4671C 3  LCMFR   -    4672C 3  LCMFRO  -    4773C 3  NORDER  -    4774C 3
PERIOD  -    4775C 3  MAXFR   -    4776C 3  RPERO   -    4777C 3  KIND2   -    5001C 3  KIND4   -    5002C 3  CAG1    -    5003C 3
CAG2    -    5004C 3  CRB1    -    5005C 3  CRB2    -    5006C 3  BB2     -    5007C 3  BB12    -    5010C 3  AA2     -    5011C 3
AA12    -    5012C 3  BVPT    -    5013C 3  BV2     -    5014C 3  CI2     -    5015C 3  CI3     -    5016C 3  CB2     -    5017C 3
CB3     -    5020C 3  CB4     -    5021C 3  CH1     -    5022C 3  CE1     -    5023C 3  CTX1    -    5024C 3  DAYSC   -    5025C 3
AABF    -    5026C 3  BTIM    -     536C 1  STIM    -     537C 1  UTIM    -     540C 1  CUEAF   -     541C 1  AFJ     -     542C 1
BFJ     -     543C 1  AFX2    -     544C 1  US1     -     545C 1  US2     -     546C 1  VS1     -     547C 1  VS2     -     550C 1
L       -     551C 1  L1      -     552C 1  CUEA    -       0

         SUBROUTINES CALLED
 SQRSD

         COMMON BLOCKS AND LENGTHS
       -  11220      CMN1    -  14702      CMN2    -  11331      QTST    -  6063
     COMPILE TIME =     196    MILLISECS
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APPROXIMATE
PROGRAM LOCATION
  0         SUBROUTINE CALCAJ (DAYX,IB,KA,SA,TA,KB,SB,TB,KC,SC,TC)              AJST.2
  0     C ========== BEGINING OF DIMENSION CHANGE  ==========                   AJST.3
  0           COMMON  BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
  0          1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
  0           COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,AJST.4
  0          1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)AJST.5
  0          2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)AJST.6
  0          3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  AJST.7
  0          3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,AJST.8
  0          3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8,MSUN,MSUI,LMIN1,LMIN2,IBSCAN
  0          4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),AJST.10
  0          4LGLTIJ(2,4,3),XXX(30)                                             AJST.11
  0          4,DAYT,KDATT,IET,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, AJST.12
  0          627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        AJST.13
  0           COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,    AJST.14
  0          1FLONG1,FLONG2,SO,TO,RDO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   AJST.15
  0          2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,AJST.16
  0          3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITAJST.17
  0          4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  AJST.18
  0          1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  AJST.19
  0          6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( AJST.20
  0          727),SVISX(27),TVISK(27),     IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2, AJST.21
  0          8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( AJST.22
  0          923,27),AREAT,AREAJ,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)AJST.23
  0          1,EPD(23,27)
  0           DIMENSION SA(23,27),TA(23,27),SB(23,27),TB(23,27),SC(23,27),TC(23,AJST.27
  0          127)                                                               AJST.28
  0           DIMENSION RHO(10),SH(10),TH(10)                                   AJST.29
  0           EQUIVALENCE (XXX(10),RHO(1)),(XXX(20),SH(1))                      AJST.30
  0     C ********** ENDING OF DIMENSION CHANGE  ***************                AJST.31
  0           EQUIVALENCE (XXX(1),DZBAR),(XXX(2),NCOUNT),(XXX(3),NSWP),(XXX(4), AJST.32
  0          1KM1),(XXX(5),EPSSDZ),(XXX(6),EPSTDZ),(XXX(7),KCHEK),(XXX(8),DROMH)AJST.33
  0     C     EPSSK(K)=EPSS*DZMH(K)  $  EPSTK(K)=EPST*DZMH(K)  (IN COMMON)      AJST.34
  0     C     RDCRIT(K)=2.0*ALPHA*EPST*DZMH(K)          (IN COMMON)             AJST.35
  0     C     WHERE    EPST =TO/DEPTH (DEPTH IN CM)   $   EPSS=ALPHA*EPST/B     AJST.36
  0     C    OTHER VARIABLES IN COMMON (MSWP,MCOUNT,ALPHA,B,TO,SO,IND,IEF1,IEF2,AJST.37
  0     C      J1,J2)                                                           AJST.38
  0           NCOUNT=0                                                          AJST.39
 14           DO 2300 J=J1,J2                                                   AJST.40
 14           I1=IEF1(J) $ I2=IEF2(J)                                           AJST.41
 14           DO 2300 I=I1,I2                                                   AJST.42
 16           IF (IND(I,J) .LT. 0) GO TO 2300                                   AJST.43
 16           SH(KA)=SA(I,J) $ TH(KA)=TA(I,J) $ SH(KB)=SB(I,J) $ TH(KB)=TB(I,J) AJST.44
 16           SH(KC)=SC(I,J) $ TH(KC)=TC(I,J)                                   AJST.45
 16           NSWP = 0                                                          AJST.46
 16      2100 KCHEK=0                                                           AJST.47
 16           DO 2200 K=KB,KC                                                   AJST.48
 51           KM1 = K-1                                                         AJST.49
 51           DROMH =-ALPHA*(TH(KM1)-TH(K)) +B*(SH(KM1)-SH(K))                  AJST.50
 51           IF(DROMH.LT.RDCRIT(K))GO TO 2200                                  AJST.51
 51           KCHEK=1                                                           AJST.52
 51           DZBAR = DZ(KM1)+DZ(K)                                             AJST.53
 51           EPSSDZ=EPSSK(K) $ EPSTDZ=EPSTK(K)                                 AJST.54
 51           SH(K)=(SH(K)*DZ(K)+((SH(KM1)+EPSSDZ)*DZ(KM1)))/DZBAR              AJST.55
 51           TH(K) =(TH(K)*DZ(K) + ((TH(KM1) - EPSTDZ)*DZ(KM1)))/DZBAR         AJST.56
 51           SH(KM1)=SH(K)-EPSSDZ $ TH(KM1)=TH(K)+EPSTDZ                       AJST.57
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                 APPROXIMATE
               PROGRAM LOCATION
                      51     2200 CONTINUE                                                          AJST.58
                     115          NSWP = NSWP + 1                                                   AJST.59
                     120          IF(NSWP.LT.MSWP)GO TO 2250                                        AJST.60
                     122          DO 2230 K=KA,KC                                                   AJST.61
                     122     2230 RHO(K)=ROO*(1.0-ALPHA*(TH(K)-TO)+B*(SH(K)-SO))                   AJST.62
                     140          PRINT 2001, IB,I,J,MSWP, (K,SH(K),TH(K),RHO(K),K=KA,KC)
                     175     2001 FORMAT (1X,* AT IB=*I3,*, (I,J) = (*,I2,1H,I2,*) NO. OF ADJUST EXCAJST.64
                     175        1EED MSWP=*I4/20X,*S(K), T(K), DENSITY(K) FOR K=*I3,2X,3E16.8/
                     175        2(43X,*FOR K=*I3,2X,3E16.8))
                     175          NCOUNT = NCOUNT + 1                                               AJST.66
                     200          IF(NCOUNT.LE.MCOUNT)GO TO 2300                                    AJST.67
                     202          PRINT 2002, MSWP, MCOUNT                                          AJST.68
                     213     2002 FORMAT(//5X,*ADJUST DENSITY  EXCEEDED *I4,* TIMES AT MORE THAN*,I4AJST.69
                     213        1,* POINTS ===JOB TERMINATES ABNORMALLY===*//)                      AJST.70
                     213          CALL EXIT                                                         AJST.71
                     215     2250 IF (KCHEK .NE. 0) GO TO 2100                                      AJST.72
                     217          SA(I,J)=SH(KA) $ TA(I,J)=TH(KA) $ SB(I,J)=SH(KB) $ TB(I,J)=TH(KB) AJST.73
                     217          SC(I,J)=SH(KC) $ TC(I,J)=TH(KC)                                   AJST.74
                     217     2300 CONTINUE                                                          AJST.75
                     217    C  **** STORE OVERLAP BOUNDARY VALUE OF SA(I,J), TA(I,J) IN BST, BTT.   AJST.76
                     245          IF (KC .EQ. KMAX) GO TO 23                                        AJST.77
                     247          DO 22 L=1,2                                                       AJST.78
                     247          L1=LAN(L)                                                         AJST.79
                     247          IF (L1 .EQ. 0) GO TO 22                                           AJST.80
                     247          I1=INS(L)
                     247          DO 21 J=1,JMAX                                                    AJST.81
                     255          BST(J,L1,KA)=SA(I1,J) $ BTT(J,L1,KA)=TA(I1,J)                     AJST.83
                     255       21 CONTINUE                                                          AJST.84
                     276       22 CONTINUE                                                          AJST.85
                     301          RETURN                                                            AJST.86
                     302       23 DO 25 L=1,2                                                       AJST.87
                     302          L1=LAN(L)                                                         AJST.88
                     302          IF (L1 .EQ. 0) GO TO 25                                           AJST.89
                     302          I1=INS(L)
                     302          DO 24 J=1,JMAX                                                    AJST.90
                     313          BST(J,L1,KA)=SA(I1,J) $ BTT(J,L1,KA)=TA(I1,J)                     AJST.92
                     313          BST(J,L1,KB)=SB(I1,J) $ BTT(J,L1,KB)=TB(I1,J)                     AJST.93
                     313          BST(J,L1,KC)=SC(I1,J) $ BTT(J,L1,KC)=TC(I1,J)                     AJST.94
                     313       24 CONTINUE                                                          AJST.95
                     345       25 CONTINUE                                                          AJST.96
                     350          RETURN                                                            AJST.97
                     351          END                                                               AJST.98
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          LENGTH OF ROUTINE    CALCAJ       470

          VARIABLE ASSIGNMENTS
DAYX    -       0    IB     -       0    KA     -       0    SA     -       0    TA     -       0    KB     -       0
SB      -       0    TB     -       0    KC     -       0    SC     -       0    TC     -       0    RHO    -    547C 1
SH      -    561C 1  TH     -       0    BPT    -     0C 0   BUT    -    154C 0  BVT    -  2244C 0   BST    -  4334C 0
BTT     -   6424C 0  BUTM   -  10514C 0  BVTM   -  10670C 0  BPTEP  -  11044C 0  DAYS   -     0C 1   KDAT   -     1C 1
DIFDAY  -     2C 1   DTIME  -     3C 1   DAYEND -     4C 1   MAXI   -      5C 1  IMAX   -     6C 1   JMAX   -     7C 1
KMAX    -    10C 1   IM1    -    11C 1   JM1    -    12C 1   IP1    -     13C 1  JP1    -    14C 1   I1     -    15C 1
J1      -    16C 1   I2     -    17C 1   J2     -    20C 1   I      -     21C 1  J      -    22C 1   K      -    23C 1
NCARD1  -    24C 1   NCARD  -    25C 1   KSYB   -    26C 1   INKD   -     27C 1  INDEX  -    30C 1   ITIL   -    31C 1
NAMX    -    41C 1   NTPD1  -    44C 1   NTPD2  -    45C 1   NAMT   -     46C 1  NTAP   -    62C 1   NRT    -    66C 1
KNR     -    72C 1   MXT    -    76C 1   LOW    -   102C 1   LSTP   -    106C 1  BG     -   112C 1   DOJT   -   116C 1
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NOTAP   -     122C 1  ITAP    -     126C 1  MTLAB   -     132C 1  PRTDAY  -     442C 1  LOWP    -     443C 1  LPSTP   -     444C 1
LSTDA   -     445C 1  IDMDA   -     446C 1  IDMDB   -     447C 1  IDMDC   -     450C 1  IDMDD   -     451C 1  NDIM    -     452C 1
NDIM1   -     453C 1  NDIM2   -     454C 1  NDSK1   -     455C 1  NDSK2   -     456C 1  NDSK3   -     457C 1  NDSK4   -     460C 1
NDSK5   -     461C 1  NDSK6   -     462C 1  NDSK7   -     463C 1  NDSK8   -     464C 1  MSUN    -     465C 1  MSJI    -     466C 1
LMIN1   -     467C 1  LMIN2   -     470C 1  IBSCAN  -     471C 1  MSCAN   -     472C 1  EPSL    -     473C 1  ALPHAR  -     474C 1
ALPHA1  -     475C 1  PWGT    -     476C 1  DTIME1  -     477C 1  DTIME2  -     500C 1  MSWP    -     501C 1  MCOUNT  -     502C 1
MSLCT   -     503C 1  LGLTIJ  -     506C 1  XXX     -     536C 1  DAYT    -     574C 1  KOATT   -     575C 1  IBT     -     576C 1
PT      -     577C 1  KT      -    1754C 1  JT      -    1755C 1  VT      -    3132C 1  WT      -    4307C 1  ST      -    5464C 1
TT      -    6641C 1  PPT     -   10016C 1  RES     -   11173C 1  UTM     -   12350C 1  VTM     -   13525C 1  DAYB    -       0C 2
KOAT3   -       1C 2  IMAXT   -       2C 2  NIB     -       3C 2  NIBT    -       4C 2  IUNDF   -       5C 2  RUNDF   -       6C 2
FLAT1   -       7C 2  FLAT2   -      10C 2  FLONG1  -      11C 2  FLONG2  -      12C 2  SO      -      13C 2  TO      -      14C 2
ROO     -      15C 2  ALPHA   -      16C 2  B       -      17C 2  HEATC   -      20C 2  PI      -      21C 2  RE      -      22C 2
G       -      23C 2  VISY    -      24C 2  SVISY   -      25C 2  TVISY   -      26C 2  VISZ    -      27C 2  SVISZ   -      30C 2
TVISZ   -      31C 2  POWER   -      32C 2  TAREA   -      33C 2  UAREA   -      34C 2  TVOL    -      35C 2  UVOL    -      36C 2
TKK     -      37C 2  CSTW    -      40C 2  CSTE    -      41C 2  SECDAY  -      42C 2  DXT     -      43C 2  DXJ     -      76C 2
RDXJ2   -     131C 2  DYT     -     164C 2  DYU     -     165C 2  RDYU2   -     166C 2  EPSSK   -     167C 2  EPSTK   -     201C 2
RDCRIT  -     213C 2  DZ      -     225C 2  DZMH    -     237C 2  Z       -     251C 2  DEPTH   -     263C 2  BETA    -     264C 2
F       -     317C 2  DS      -     352C 2  AYZT    -     364C 2  AUXY    -     376C 2  AXZT    -     431C 2  AXZU    -    1047C 2
AX      -    1465C 2  AY      -    2103C 2  AZ      -    2521C 2  CSX     -    3137C 2  CSY     -    3555C 2  CSZ     -    4173C 2
CTX     -    4205C 2  CTY     -    4623C 2  CTZ     -    5241C 2  VISX    -    5253C 2  SVISX   -    5306C 2  TVISX   -    5341C 2
IGI     -    5374C 2  IMX     -    5375C 2  IMEF1   -    5376C 2  IMEF2   -    5377C 2  JMX     -    5400C 2  JMEF1   -    5401C 2
JMEF2   -    5402C 2  LAN     -    5403C 2  ING     -    5405C 2  INDBL   -    5407C 2  INDBR   -    5442C 2  LSBY    -    5475C 2
IEF1    -    5524C 2  IEF2    -    5557C 2  IND     -    5612C 2  AREAT   -    6767C 2  AREAU   -    6770C 2  VOLT    -    6771C 2
VOLU    -    6772C 2  AREATB  -    6773C 2  AREAUB  -    6774C 2  VOLTB   -    6775C 2  VOLUB   -    6776C 2  ATXY    -    6777C 2
EPD     -   10154C 2  DZBAR   -     536C 1  NCOUNT  -     537C 1  NSWP    -     540C 1  KM1     -     541C 1  EPSSDZ  -     542C 1
EPSTDZ  -     543C 1  KCHEK   -     544C 1  DROMH   -     545C 1  L       -     360     L1      -     357

        SUBROUTINES CALLED
OUTPTC    EXIT      Q8QRSD

        COMMON BLOCKS AND LENGTHS
      -  11220      CMN1    -  14702      CMN2    -  11331
   COMPILE TIME =     199     MILLISECS
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CARD        APPROXIMATE
NUMBER      PROGRAM LOCATION
3160           0         SUBROUTINE WJVCAL (NDSKX,NDSKZ,NDSKR)                                  WJVC.2
3161           0    C  ========== BEGINING OF DIMENSION CHANGE  ==========                      WJVC.3
3162           0         COMMON  BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
3163           0        1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
3164           0         COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,WJVC.4
3165           0        1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)WJVC.5
3166           0        2,NAMK(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)WJVC.6
3167           0        3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,   WJVC.7
3168           0        3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,WJVC.8
3169           0        3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANWJVC.9
3170           0        4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),WJVC.10
3171           0        4LGLTIJ(2,4,3),XXX(30)                                              WJVC.11
3172           0        4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, WJVC.12
3173           0        627),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)         WJVC.13
3174           0         DIMENSION XUVR(2484)                                               WJVC.14
3175           0         EQUIVALENCE (PPT(1),XUVR(1))                                       WJVC.15
3176           0         DIMENSION BT(624),DT(3106)                                         WJVC.16
3177           0         EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                                WJVC.17
3178           0         COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,     WJVC.18
3179           0        1FLONG1,FLONG2,SO,TO,ROO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,    WJVC.19
3180           0        2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,WJVC.20
3181           0        3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITWJVC.21
3182           0        4(10),DZ(10),DZ4H(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  WJVC.22
3183           0        1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  WJVC.23
3184           0        6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( WJVC.24
3185           0        727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,  WJVC.25
3186           0        8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( WJVC.26
3187           0        923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)WJVC.27
3188           0        1,EPD(23,27)
3189           0         DIMENSION X(2812),Y(2013)
3190           0         EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                 WJVC.30
3191           0         COMMON/CMN3/BP(624),DA(3106),DB(3106),DC(3106)                     WJVC.31
3192           0         DIMENSION P(23,27)                                                 WJVC.32
3193           0         DIMENSION  U(23,27), V(23,27), W(23,27), S(23,27), T(23,27)        WJVC.33
3194           0         EQUIVALENCE (BP(1),DAYX),(BP(2),KDATX),(BP(3),IB),(BP(4),P(1))     WJVC.34
3195           0         EQUIVALENCE (DA(1),KA),(DA(2), U(1)),(DA(623), V(1)),(DA(1244), W(WJVC.35
3196           0        11)),(DA(1865), S(1)),(DA(2486), T(1))                              WJVC.36
3197           0         COMMON/ENSL/DAYSE,KDATSE,ENGE(5),PCH(4,3),UCH(4,10,3),VCH(4,10,3),WJVC.39
3198           0        1WCH(4,10,3),SCH(4,10,3),TCH(4,10,3),ITEM,NWDS,LEL,ENGL(6,100)      WJVC.40
3199           0        1,FAC(6),IPL(6),IR,NPLX                                             WJVC.41
3200           0         DIMENSION WW(23,27),JBAR(23,27),VBAR(23,27),BWT(27,4,10)           WJVC.42
3201           0         COMMON/QTST/DAYFR,KDATFR,IBFR,TAIR(23,27),QT(23,27),STX(23,27),
3202           0        1STY(23,27), IDMQT,IDMF2,IDMF4,LCMFR(65),LCMFRD,NORDER,PERIOD,MAXFR
3203           0        1,RPERD(2),KIND2,KIND4,CAG1,CAG2,CRB1,CRB2,BB2,BB12,AA2,AA12,BVPT,
3204           0        1BV2,CI2,CI3,CB2,CB3,CB4,CH1,CE1,CTX1,DAYSC,XABF(541)
3205           0    C  ********** ENDING OF DIMENSION CHANGE  ***************               WJVC.43
3206           0         EQUIVALENCE (WT(1),WW(1))                                          WJVC.44
3207           0         EQUIVALENCE (STX(1),JBAR(1)),(STY(1),VBAR(1))                      WJVC.45
3208           0         EQUIVALENCE (DB(1),BWT(1))                                         WJVC.46
3209          10         CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKX) $ CALL REWDTP (NDSKZ)    WJVC.47
3210          13         CALL REWDTP (NDSKR)                                                WJVC.48
3211          15         DAYSE=DAYS                                                         WJVC.49
3212          15         KDATSE=KDAT                                                        WJVC.50
3213          16         DO 490 I=1,5                                                       WJVC.51
3214          16     490 ENGE(I)=0.0                                                        WJVC.52
3215          25      10 CALL RDBUFL (NDSK5,IDMDB,Y)                                        WJVC.53
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CARD         APPROXIMATE
NUMBER     PROGRAM LOCATION
 3216           34            CALL RDBUFL (NDSKX,NDIM1,BP)                                   WJVC.54
 3217           41            CALL RDBUFL (NDSKR,IDMDC,XJVR)                                 WJVC.55
 3218           46            DD=0.0                                                         WJVC.56
 3219           46       C    RDYJ2=0.5/DYJ   $   RDXJ2(J)=0.5/DXU(J)                        WJVC.57
 3220           46       C    CALCULATION OF UBAR, VBAR  (WITHOUT THE OVERLAP BOUNDARY POINTS) WJVC.58
 3221           46            DO 14 J=J1,J2                                                  WJVC.59
 3222           46            I1=IEF1(J) $ I2=IEF2(J) $ JP1=J+1                              WJVC.60
 3223           46            DO 14 I=I1,I2                                                  WJVC.61
 3224           50            IF (IND(I,J) .LT. 0 .OR. IND(I,J) .GT. 6) GO TO 14             WJVC.62
 3225           50            IP1=I+1                                                        WJVC.63
 3226           50            UBAR(I,J)=(P(I,J)+P(IP1,J)-P(I,JP1)-P(IP1,JP1))*RDYU2          WJVC.64
 3227           50            VBAR(I,J)=(P(IP1,J)+P(IP1,JP1)-P(I,J)-P(I,JP1))*RDXU2(J)       WJVC.65
 3228           50         14 CONTINUE                                                       WJVC.66
 3229           50       C  ----THOSE WITH IND(I,J) .LT. 0, BUT .NE. IUNDF                   WJVC.67
 3230           50       C  CALCULATION OF UBAR, VBAR AT LEFT BOUNDARY.                      WJVC.68
 3231          125            IF (ING(1) .EQ. 0) GO TO 16                                    WJVC.69
 3232          127            IP1=ING(1) $ I=IP1-1                                           WJVC.70
 3233          131            DO 15 J=J1,J2                                                  WJVC.71
 3234          131            IF (INDBL(J) .LT. 0 .OR. INDBL(J) .GT. 6) GO TO 15             WJVC.72
 3235          131            JP1=J+1                                                        WJVC.73
 3236          131            UBAR(I,J)=(P(I,J)+P(IP1,J)-P(I,JP1)-P(IP1,JP1))*RDYU2          WJVC.74
 3237          131            VBAR(I,J)=(P(IP1,J)+P(IP1,JP1)-P(I,J)-P(I,JP1))*RDXU2(J)       WJVC.75
 3238          131         15 CONTINUE                                                       WJVC.76
 3239          206         16 IF (ING(2) .EQ. 0) GO TO 21                                    WJVC.77
 3240          206       C  CALCULATION OF UBAR, VBAR AT RIGHT BOUNDARY.                     WJVC.78
 3241          206       C  **** SPECIAL BOUNDARY VALUE OF NEW P SHOULD BE PRE-STORED IN BPTEP. WJVC.79
 3242          210            I=ING(2)+1                                                     WJVC.80
 3243          211            DO 20 J=J1,J2                                                  WJVC.81
 3244          211            IF (INDBR(J) .LT. 0 .OR. INDBR(J) .GT. 6) GO TO 20             WJVC.82
 3245          211            JP1=J+1                                                        WJVC.83
 3246          211            UBAR(I,J)=(P(I,J)+BPTEP(J,IB)-P(I,JP1)-BPTEP(JP1,IB))*RDYU2    WJVC.84
 3247          211            VBAR(I,J)=(BPTEP(J,IB)+BPTEP(JP1,IB)-P(I,J)-P(I,JP1))*RDXU2(J) WJVC.85
 3248          211         20 CONTINUE                                                       WJVC.86
 3249          262         21 CALL WTBUFL (NDSKZ,NDIM1,PP)                                   WJVC.87
 3250          270         11 CALL RDBUFL (NDSKX,NDIM2,DA)                                   WJVC.88
 3251          270       C  *****FILL IN OVERLAP BOUNDARY VALUE OF S(I,J), T(I,J) BY BST, BTT WJVC.89
 3252          275            DD=DD+DZ(KA)                                                   WJVC.90
 3253          275            ZH=DEPTH-DD                                                    WJVC.91
 3254          275            LI=3                                                           WJVC.92
 3255          275            DO 19 L=1,2                                                    WJVC.93
 3256          275            LI=LI-2 $ L1=LAN(L)                                            WJVC.94
 3257          275            IF (L1 .EQ. 0) GO TO 19                                        WJVC.95
 3258          275            I1=ING(L)-LI $ L1=L1+LI                                        WJVC.96
 3259          275            DO 18 J=1,JMAX                                                 WJVC.97
 3260          312            S(I1,J)=BST(J,L1,KA) $ T(I1,J)=BTT(J,L1,KA)                    WJVC.98
 3261          312         18 CONTINUE                                                       WJVC.99
 3262          333         19 CONTINUE                                                       WJVC.100
 3263          333       C                                                                   WJVC.101
 3264          333       C  (1) CALCULATION OF DEVIATE U,V BY SUBTRACT UTM,VTM, FOR IND .GE. 0 WJVC.102
 3265          333       C  (2) CALCULATION OF DEVIATE U,V BY SUBTRACT UTM,VTM AT THE BOUNDARY. WJVC.103
 3266          333       C  (3) CALCULATION OF U, V BY ADDING UBAR, VBAR TO DEVIATE U, V.    WJVC.104
 3267          336            DO 250 J=J1,J2                                                 WJVC.105
 3268          336            JP1=J+1                                                        WJVC.106
 3269          336            I1=IEF1(J)-1 $ I2=IEF2(J)+1                                    WJVC.107
 3270          336            IF (I1 .LT. 1) I1=1                                            WJVC.108
 3271          336            IF (I2 .GT. IMAX) I2=IMAX                                      WJVC.109
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CARD        APPROXIMATE
NUMBER      PROGRAM LOCATION
3272            335            DO 250 I=I1,I2                                                          WJVC.110
3273            362            IF (IND(I,J) .EQ. IUNDF) GO TO 250                                      WJVC.111
3274            362            IF (IND(I,J)) 241,243,242                                               WJVC.112
3275            362       241  JBD=-IND(I,J)                                                           WJVC.113
3276            362            II=ING(1)-1                                                             WJVC.114
3277            362            IF (I .NE. II) GO TO 245                                                WJVC.115
3278            362            INDEX=INDBL(J)                                                          WJVC.116
3279            362            GO TO 248                                                               WJVC.117
3280            362       245  II=ING(2)+1                                                             WJVC.118
3281            362            IF (I .EQ. II) GO TO 247                                                WJVC.119
3282            362            PRINT 246, (ING(K),K=1,2),II                                            WJVC.120
3283            436       246  FORMAT (//10X,*ING(1), ING(2), I =*3I6*  NOT AGREE RELATION OF  (IWJVC.121
3284            436           1 .EQ. ING(1)-1 .OR. I .EQ. ING(2)+1)*/25X,*=====JOB TERMINATES ABNWJVC.122
3285            436           1ORMALLY=====  CALLED FROM SUBROUTINE WUVCAL   =====*//)                 WJVC.123
3286            436            CALL EXIT                                                               WJVC.124
3287            437       247  INDEX=INDBR(J)                                                          WJVC.125
3288            446       248  IF (INDEX .LT. 0 .OR. INDEX .GT. 6) GO TO 250                           WJVC.126
3289            450            U(I,J)=BUT(J,JBD,KA)-BUTM(J,JBD) $V(I,J)=BVT(J,JBD,KA)-BVTM(J,JBD)WJVC.127
3290            450            U(I,J)=U(I,J)+UBAR(I,J) $ V(I,J)=V(I,J)+VBAR(I,J)                       WJVC.128
3291            450            GO TO 250                                                               WJVC.129
3292            476       242  IF (IND(I,J) .GT. 6) GO TO 250                                          WJVC.130
3293            500       243  U(I,J)=U(I,J)-UTM(I,J) $ V(I,J)=V(I,J)-VTM(I,J)                         WJVC.131
3294            511            IF (MSUI .GE. 0) GO TO 244                                              WJVC.132
3295            512            U(I,J)=U(I,J)+UBAR(I,J) $ V(I,J)=V(I,J)+VBAR(I,J)                       WJVC.133
3296            512            GO TO 250                                                               WJVC.134
3297            521       244  VOLM=DZ(KA)*AUXY(J)                                                     WJVC.135
3298            522            IP1=I+1                                                                 WJVC.136
3299            527            TAV=(T(I,J)+T(I,JP1)+T(IP1,JP1)+T(IP1,J))*0.25                          WJVC.137
3300            527            SAV=(S(I,J)+S(I,JP1)+S(IP1,JP1)+S(IP1,J))*0.25                          WJVC.138
3301            527            RMSS=VOLM*(1.0-ALPHA*(TAV-T0)+B*(SAV-S0))                               WJVC.139
3302            527            EK1=RMSS*(UBAR(I,J)*UBAR(I,J)+VBAR(I,J)*VBAR(I,J))                      WJVC.140
3303            527            EK2=RMSS*(U(I,J)*U(I,J)+V(I,J)*V(I,J))                                  WJVC.141
3304            527            U(I,J)=U(I,J)+UBAR(I,J) $ V(I,J)=V(I,J)+VBAR(I,J)                       WJVC.142
3305            527            EK3=RMSS*(U(I,J)*U(I,J)+V(I,J)*V(I,J))                                  WJVC.143
3306            527            ENGE(1)=ENGE(1)+EK1 $ ENGE(2)=ENGE(2)+EK2 $ ENGE(3)=ENGE(3)+EK3         WJVC.144
3307            527            ENGE(4)=ENGE(4)+RMSS*ZH                                                 WJVC.145
3308            527       250  CONTINUE                                                                WJVC.146
3309            527       C    CALCULATION OF W    (WITHOUT BOUNDARY OVERLAP)                          WJVC.147
3310            614            IF (KA .NE. KMAX) GO TO 5000
3311            616            DO 4000 J=J1,J2
3312            616            I1=IEF1(J) $ I2=IEF2(J)
3313            616            DO 4000 I=I1,I2
3314            622      4000  W(I,J)=0.0
3315            640            GO TO 4500
3316            641      5000  CONTINUE
3317            641            AYZT2=AYZT(KA)*0.5 $ AXZU2=0.0                                          WJVC.148
3318            641            DO 350 J=J1,J2                                                          WJVC.149
3319            641            AXZJM2=AXZU2 $ AXZU2=AXZU(J,KA)*0.5                                     WJVC.150
3320            641            I1=IEF1(J) $ I2=IEF2(J) $ JM1=J-1                                       WJVC.151
3321            641            DO 350 I=I1,I2                                                          WJVC.152
3322            655            IM1=I-1                                                                 WJVC.153
3323            655            IF (IND(I,J)) 350,320,300                                               WJVC.154
3324            655       300  INDEX=IND(I,J)                                                          WJVC.155
3325            655            GO TO (301,302,303,304,305,306,307,308,309,310,311,312) INDEX           WJVC.156
3326            655       301  DUS=(U(IM1,J)-U(I,J))*AYZT2 $ DVS=-(V(I,J)+V(IM1,J))*AXZU2              WJVC.157
3327            655            GO TO 321                                                               WJVC.158
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      APPROXIMATE
   PROGRAM LOCATION
        655      302  DUS=-(U(I,J)+U(I,JM1))*AYZT2 $ DVS=V(I,JM1)*AXZUM2-V(I,J)*AXZU2   WJVC.159
        655           GO TO 321                                                          WJVC.160
        655      303  DUS=-U(I,J)*AYZT2 $ DVS=-V(I,J)*AXZU2                              WJVC.161
        655           GO TO 321                                                          WJVC.162
        655      304  DUS=           (U(IM1,JM1)-U(I,J)-U(I,JM1))*AYZT2                  WJVC.163
        655           DVS=(V(I,JM1)+V(IM1,JM1))*AXZUM2- V(I,J)*AXZU2                     WJVC.164
        655           GO TO 321                                                          WJVC.165
        655      305  DUS=(U(IM1,J)               -U(I,J)-U(I,JM1))*AYZT2                WJVC.166
        655           DVS= V(I,JM1)                 *AXZUM2-(V(I,J)+V(IM1,J))*AXZU2      WJVC.167
        655           GO TO 321                                                          WJVC.168
        655      306  DUS=(U(IM1,J)+U(IM1,JM1)-U(I,J)          )*AYZT2                   WJVC.169
        655           DVS=           V(IM1,JM1) *AXZUM2-(V(I,J)+V(IM1,J))*AXZU2          WJVC.170
        655           GO TO 321                                                          WJVC.171
        655      307  DUS=(U(IM1,JM1)-U(I,JM1))*AYZT2                                    WJVC.172
        655           DVS=(V(I,JM1)+V(IM1,JM1))*AXZUM2                                   WJVC.173
        655           GO TO 321                                                          WJVC.174
        655      308  DUS=(U(IM1,J)+U(IM1,JM1))*AYZT2                                    WJVC.175
        655           DVS=V(IM1,JM1)*AXZUM2-V(IM1,J)*AXZU2                               WJVC.176
        655           GO TO 321                                                          WJVC.177
        655      309  DUS=-U(I,JM1)*AYZT2 $ DVS=V(I,JM1)*AXZUM2                          WJVC.178
        655           GO TO 321                                                          WJVC.179
        655      310  DUS=U(IM1,J)*AYZT2 $ DVS=-V(IM1,J)*AXZU2                           WJVC.180
        655           GO TO 321                                                          WJVC.181
        655      311  DUS=U(IM1,JM1)*AYZT2 $ DVS=V(IM1,JM1)*AXZUM2                       WJVC.182
        655           GO TO 321                                                          WJVC.183
        655      312  DUS=(U(IM1,J)+U(IM1,JM1)        -U(I,JM1))*AYZT2                   WJVC.184
        655           DVS=(V(I,JM1)+V(IM1,JM1))*AXZUM2-        V(IM1,J) *AXZU2           WJVC.185
        655           GO TO 321                                                          WJVC.186
        655      320  DUS=(U(IM1,J)+U(IM1,JM1)-U(I,J)-U(I,JM1))*AYZT2                    WJVC.187
        655           DVS=(V(I,JM1)+V(IM1,JM1))*AXZUM2-(V(I,J)+V(IM1,J))*AXZU2           WJVC.188
        655      321  IF (KA .NE. 1) GO TO 322                                           WJVC.189
        655           WW(I,J)=     -(DUS+DVS)/ATXY(I,J)                                  WJVC.190
        655           GO TO 323                                                          WJVC.191
        655      322  WW(I,J)=WW(I,J)-(DUS+DVS)/ATXY(I,J)                                WJVC.192
        655      323  W(I,J)=WW(I,J)                                                     WJVC.193
        655      350  CONTINUE                                                           WJVC.194
       1107     4500  CONTINUE
       1107    C    ***** STORE BOUNDARY VALUE OF W IN BWT.                              WJVC.195
       1110           DO 352 L=1,2                                                       WJVC.196
       1110           L1=LAN(L)                                                          WJVC.197
       1110           IF (L1 .EQ. 0) GO TO 352                                           WJVC.198
       1110           I1=ING(L)                                                          WJVC.199
       1110           DO 351 J=1,JMAX                                                    WJVC.200
       1120      351  BWT(J,L1,KA)=W(I1,J)                                               WJVC.201
       1136      352  CONTINUE                                                           WJVC.202
       1141           CALL WTBUFL (NDSKZ,NDIM2,DA)                                       WJVC.203
       1150           IF (KA .NE. KMAX) GO TO 11                                         WJVC.204
       1153           IF (IB .NE. NIB) GO TO 10                                          WJVC.205
       1157           IF (MSUI .LT. 0) RETURN                                            WJVC.206
       1160           LEL=LEL+1                                                          WJVC.207
       1160           RO5=ROO*0.5                                                        WJVC.208
       1160           DO 500 I=1,3                                                       WJVC.209
       1160           ENGE(I)=RO5*ENGE(I)                                                WJVC.210
       1160      500  CONTINUE                                                           WJVC.211
       1171           ENGE(4)=ROO*G*ENGE(4) $ ENGE(5)=ENGE(3)+ENGE(4)                    WJVC.212
       1171           ENGL(1,LEL)=DAYS                                                   WJVC.213
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CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
3384               1171              DO 540 I=2,ITEM                                                    WJVC.214
3385               1171              IM1=I-1                                                            WJVC.215
3386               1171              ENGL(I,LEL)=ENGE(IM1)                                              WJVC.216
3387               1171        540   CONTINUE                                                           WJVC.217
3388               1216              IF (LEL .LT. NWDS) RETURN                                          WJVC.218
3389               1220              CALL PRTENGX (NTP01,KDAT,ITEM,NWDS,LEL,ENGL)                       WJVC.219
3390               1230              XMIN=2.0 $ XMAX=1.0 $ KF=1                                         WJVC.220
3391               1230              CALL MPLOT (NTP01,KDAT,ITEM,NWDS,LEL,ENGL,XMIN,XMAX,IR,NPLX,IPL,   WJVC.221
3392               1230             1FAC,KF)                                                            WJVC.222
3393               1252              XMIN=-1.0 $ XMAX=-2.0 $ KF=0                                       WJVC.223
3394               1252              CALL MPLOT (NTP01,KDAT,ITEM,NWDS,LEL,ENGL,XMIN,XMAX,IR,NPLX,IPL,   WJVC.224
3395               1252             1FAC,KF)                                                            WJVC.225
3396               1274              LEL=0                                                              WJVC.226
3397               1274              RETURN                                                             WJVC.227
3398               1275              END                                                                WJVC.228

        LENGTH OF ROUTINE   WJVCAL       1373

        VARIABLE ASSIGNMENTS
NDSKK   -      0     NDSKZ   -      0     NDSKR   -      0     XJVR    -  10016C 1  BT      -    574C 1  OT      -   1754C 1
X       -     0C 2   Y       -  5374C 2   P       -     3C 3   U       -   1161C 3  V       -   2336C 3  W       -   3513C 3
S       -  4670C 3   T       -  6045C 3   WW      -  4307C 1   UBAR    -   2335C 5  VBAR    -   3512C 5  BWT     -   7222C 3
BPT     -     0C 0   BUT     -   154C 0   BVT     -  2244C 0   BST     -   4334C 0  BTT     -   6424C 0  BUTM    -  10514C 0
BVTM    - 10670C 0   BPTEP   - 11044C 0   DAYS    -     0C 1   KDAT    -      1C 1  DIFDAY  -      2C 1  DTIME   -      3C 1
DAYEND  -     4C 1   MAXI    -     5C 1   IMAX    -     6C 1   JMAX    -      7C 1  KMAX    -     10C 1  IM1     -     11C 1
JM1     -    12C 1   IP1     -    13C 1   JP1     -    14C 1   I1      -     15C 1  J1      -     16C 1  I2      -     17C 1
J2      -    20C 1   I       -    21C 1   J       -    22C 1   K       -     23C 1  NCARD1  -     24C 1  NCARD   -     25C 1
KSYB    -    26C 1   INKD    -    27C 1   INDEX   -    30C 1   ITIL    -     31C 1  NAMX    -     41C 1  NTP01   -     44C 1
NTP02   -    45C 1   NAMT    -    46C 1   NTAP    -    62C 1   NRT     -     66C 1  KNR     -     72C 1  MWT     -     76C 1
LDW     -   102C 1   LSTP    -   106C 1   BG      -   112C 1   DOUT    -    116C 1  NDTAP   -    122C 1  ITAP    -    126C 1
MTLA3   -   132C 1   PRTDAY  -   442C 1   LDWP    -   443C 1   LPSTP   -    444C 1  LSTDA   -    445C 1  IDMDA   -    446C 1
IDMD3   -   447C 1   IDMDC   -   450C 1   IDMDD   -   451C 1   NDIM    -    452C 1  NDIM1   -    453C 1  NDIM2   -    454C 1
NDSK1   -   455C 1   NDSK2   -   456C 1   NDSK3   -   457C 1   NDSK4   -    460C 1  NDSK5   -    461C 1  NDSK6   -    462C 1
NDSK7   -   463C 1   NDSK8   -   464C 1   MSUN    -   465C 1   MSUI    -    466C 1  LMIN1   -    467C 1  LMIN2   -    470C 1
IBSCAN  -   471C 1   MSCAN   -   472C 1   EPSL    -   473C 1   ALPHAR  -    474C 1  ALPHA1  -    475C 1  PWGT    -    476C 1
DTIME1  -   477C 1   DTIME2  -   500C 1   MSWP    -   501C 1   MCOUNT  -    502C 1  MSLCT   -    503C 1  LGLTIJ  -    506C 1
XXX     -   536C 1   DAYT    -   574C 1   KDATT   -   575C 1   IBT     -    576C 1  PT      -    577C 1  KT      -   1754C 1
JT      -  1755C 1   VT      -  3132C 1   WT      -  4307C 1   ST      -   5464C 1  TT      -   6641C 1  PPT     -  10016C 1
RES     - 11173C 1   UTM     - 12350C 1   VTM     - 13525C 1   DAYB    -      0C 2  KDATB   -      1C 2  IMAXT   -      2C 2
NIB     -     3C 2   NIBT    -     4C 2   IUNDF   -     5C 2   RUNDF   -      6C 2  FLAT1   -      7C 2  FLAT2   -     10C 2
FLONG1  -    11C 2   FLONG2  -    12C 2   SO      -    13C 2   TO      -     14C 2  ROO     -     15C 2  ALPHA   -     16C 2
B       -    17C 2   HEATC   -    20C 2   PI      -    21C 2   PE      -     22C 2  G       -     23C 2  VISY    -     24C 2
SVISY   -    25C 2   TVISY   -    26C 2   VISZ    -    27C 2   SVISZ   -     30C 2  TVISZ   -     31C 2  POWER   -     32C 2
TAREA   -    33C 2   UAREA   -    34C 2   TVOL    -    35C 2   UVOL    -     36C 2  TKK     -     37C 2  CSTQ    -     40C 2
CSTE    -    41C 2   SECDAY  -    42C 2   DXT     -    43C 2   DXU     -     76C 2  RDXU2   -    131C 2  DYT     -    164C 2
DYU     -   165C 2   RDYU2   -   166C 2   EPSSK   -   167C 2   EPSTK   -    201C 2  ROCRIT  -    213C 2  DZ      -    225C 2
DZMH    -   237C 2   Z       -   251C 2   DEPTH   -   263C 2   BETA    -    264C 2  F       -    317C 2  DG      -    352C 2
AYZT    -   364C 2   AUXY    -   376C 2   AXZT    -   431C 2   AXZU    -   1047C 2  AX      -   1465C 2  AY      -   2103C 2
AZ      -  2521C 2   CSX     -  3137C 2   CSY     -  3555C 2   CSZ     -   4173C 2  CTX     -   4205C 2  CTY     -   4623C 2
CTZ     -  5241C 2   VISX    -  5253C 2   SVISX   -  5305C 2   TVISX   -   5341C 2  IBI     -   5374C 2  IMX     -   5375C 2
IMEF1   -  5376C 2   IMEF2   -  5377C 2   JMX     -  5400C 2   JMEF1   -   5401C 2  JMEF2   -   5402C 2  LAN     -   5403C 2
ING     -  5405C 2   INDBL   -  5407C 2   INDBR   -  5442C 2   LSBY    -   5475C 2  IEF1    -   5524C 2  IEF2    -   5557C 2
IND     -  5612C 2   AREAT   -  6767C 2   AREAU   -  6770C 2   VOLT    -   6771C 2  VOLU    -   6772C 2  AREATB  -   6773C 2
AREAUB  -  6774C 2   VOLTB   -  6775C 2   VOLUB   -  6776C 2   ATXY    -   6777C 2  EPD     -  10154C 2  BP      -      0C 3
CA      - 11630C 3   UOB     -  7222C 3   OC      - 15264C 3   DAYSE   -      0C 4  KDATSE  -      1C 4  ENGE    -      2C 4
PCH     -     7C 4   UCH     -    23C 4   VCH     -   213C 4   WCH     -    403C 4  SCH     -    573C 4  TCH     -    763C 4
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ITEM    -   1153C 4  NWDS    -   1154C 4  LEL     -   1155C 4  ENGL    -   1156C 4  FAC     -   2306C 4  IPL     -   2314C 4
IR      -   2322C 4  NPLX    -   2323C 4  DAYFR   -      0C 5  KDATFR  -      1C 5  IBFR    -      2C 5  TAIR    -      3C 5
DT      -   1160C 5  STX     -   2335C 5  STY     -   3512C 5  IDMQT   -   4667C 5  IDMF2   -   4670C 5  IDMF4   -   4671C 5
LCMFR   -   4672C 5  LCMFRD  -   4773C 5  NORDER  -   4774C 5  PERIOD  -   4775C 5  MAXFR   -   4776C 5  RPERD   -   4777C 5
KIND2   -   5001C 5  KIND4   -   5002C 5  CAG1    -   5003C 5  CAG2    -   5004C 5  CRB1    -   5005C 5  CRB2    -   5006C 5
BB2     -   5007C 5  BB12    -   5010C 5  AA2     -   5011C 5  AA12    -   5012C 5  BVPT    -   5013C 5  BV2     -   5014C 5
CI2     -   5015C 5  CI3     -   5016C 5  CB2     -   5017C 5  CB3     -   5020C 5  CB4     -   5021C 5  CH1     -   5022C 5
CE1     -   5023C 5  CTX1    -   5024C 5  DAYSC   -   5025C 5  XABF    -   5026C 5  DAYX    -      0C 3  KDATX   -      1C 3
IB      -      2C 3  X4      -   1160C 3  DD      -   1331     ZH      -   1330     LI      -   1327     L       -   1326
L1      -   1325     JBD     -   1324     II      -   1323     VOLM    -   1322     TAV     -   1321     SAV     -   1320
RMSS    -   1317     EK1     -   1316     EK2     -   1315     EK3     -   1314     AYZT2   -   1313     AXZU2   -   1312
AXZUM2  -   1311     DUS     -   1310     DVS     -   1307     RD5     -   1306     XMIN    -   1305     XMAX    -   1304
KF      -   1303

          SUBROUTINES CALLED
REWDTP    RDBUFL     WTBUFL     OUTPTC     EXIT      PRTENGX     MPLOT     QBQRSD

          COMMON BLOCKS AND LENGTHS
      -   11220      CMN1    -  14702      CMN2    -  11331      CMN3    -  23326      ENSL    -  2324      QTST    -  6063
    COMPILE TIME =     629     MILLISECS
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        APPROXIMATE
     PROGRAM LOCATION
            0            SUBROUTINE WFLOUT (NDSKX,NDSKZ)                                    WFLO.2
            0       C  *****FILL W BOUNDARY AND OUTPUT***************                       WFLO.3
            0       C  ========== BEGINING OF DIMENSION CHANGE  ==========                  WFLO.4
            0            COMMON   BPT(27,4),BUT(27,4,10),BVT(27,4,10),BST(27,4,10),BTT(27,4
            0           1,10),BUTM(27,4),BVTM(27,4),BPTEP(27,4)
            0            COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,WFLO.5
            0           1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)WFLO.6
            0           2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)WFLO.7
            0           3,LSTP(4),RG(4),DOUT(4),NDTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LOWP,   WFLO.8
            0           3LPSTP,LSTDA,ID4DA,ID4DB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,WFLO.9
            0           3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANWFLO.10
            0           4,MSCAN,EPSL,ALPHAR,ALPHAI,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),WFLO.11
            0           4LGLTIJ(2,4,3),XXX(30)                                              WFLO.12
            0           4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, WFLO.13
            0           527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)       WFLO.14
            0            DIMENSION XUVR(2484)                                               WFLO.15
            0            EQUIVALENCE (PPT(1),XUVR(1))                                       WFLO.16
            0            DIMENSION BT(624),DT(3106)                                         WFLO.17
            0            EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                                WFLO.18
            0            COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,    WFLO.19
            0           1FLONG1,FLONG2,SO,TO,RDO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,   WFLO.20
            0           2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,WFLO.21
            0           3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITWFLO.22
            0           4(10),DZ(10),DZ4H(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  WFLO.23
            0           1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  WFLO.24
            0           6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( WFLO.25
            0           727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,  WFLO.26
            0           8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( WFLO.27
            0           923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)WFLO.28
            0           1,EPD(23,27)
            0            DIMENSION X(2812),Y(2013)
            0            EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                 WFLO.31
            0            COMMON/CMN3/BP(624),DA(3106),DB(3106),DC(3106)                     WFLO.32
            0            DIMENSION P(23,27)                                                 WFLO.33
            0            DIMENSION UA(23,27),VA(23,27),WA(23,27),SA(23,27),TA(23,27)        WFLO.34
            0            EQUIVALENCE (BP(1),DAYX),(BP(2),KDATX),(BP(3),IB),(BP(4),P(1))     WFLO.35
            0            EQUIVALENCE (DA(1),KA),(DA(2),UA(1)),(DA(623),VA(1)),(DA(1244),WA(WFLO.36
            0           11)),(DA(1865),SA(1)),(DA(2486),TA(1))                              WFLO.37
            0            COMMON/ENSL/DAYSE,KDATSE,ENGE(5),PCH(4,3),UCH(4,10,3),VCH(4,10,3),WFLO.40
            0           1WCH(4,10,3),SCH(4,10,3),TCH(4,10,3),ITEM,NWDS,LEL,ENGL(6,100)     WFLO.41
            0           1,FAC(6),IPL(6),IR,NPLX                                             WFLO.42
            0            DIMENSION BWT(27,4,10)                                             WFLO.43
            0            DIMENSION ENSLT(619)                                               WFLO.44
            0       C  ********** ENDING OF DIMENSION CHANGE  ****************              WFLO.45
            0            EQUIVALENCE (DAYSE,ENSLT(1))                                       WFLO.46
            0            EQUIVALENCE (DB(1),BWT(1))                                         WFLO.47
            0            DIMENSION NAM1(3),NAM2(3),NAM3(3),NAM4(3)                          WFLO.48
            0            EQUIVALENCE (NAMT(1),NAM1(1)),(NAMT(4),NAM2(1)),(NAMT(7),NAM3(1)),WFLO.49
            0           1(NAMT(10),NAM4(1))                                                 WFLO.50
           10            CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKX) $ CALL REWDTP (NDSKZ)   WFLO.51
           13            NAMX(2)=10HCALCULATED $ NAMX(3)=10H OUTPUT                         WFLO.52
           13        10  CALL RDBUFL (NDSK5,IDMDB,Y)                                        WFLO.53
           23            CALL RDBUFL (NDSKX,NDIM1,BP)                                       WFLO.54
           30            CALL WTBUFL (NDSKZ,NDIM1,BP)                                       WFLO.55
           37            IF (MSUI .LT. 0) GO TO 12                                          WFLO.56
           40            LFE=2 $ NAMX(1)=10H P(I,J)                                         WFLO.57
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CARD              APPROXIMATE
NUMBER         PROGRAM LOCATION
3455              44             IF (LSTP(1) .EQ. 0)CALL GTABOUT (NAMX,NTPO2,KDAT,IMAX,JMAX,DAYX,IBWFLO.58
3456              44            1,0,LFE,LSBY,P)                                                       WFLO.59
3457              63             IF (LSTP(2) .LE. 0) CALL WTBUF (NTAP(2),NDIM1,BP)                    WFLO.60
3458              72             IF (LSTP(3) .EQ. 0) CALL WTBUF (NTAP(3),NDIM1,BP)                    WFLO.61
3459             100             LFE=1                                                                WFLO.62
3460             100        12   CONTINUE                                                             WFLO.63
3461             101        11   CALL RDBUFL (NDSKX,NDIM2,DA)                                         WFLO.64
3462             101      C  ******* FILL IN OVERLAP BOUNDARY VALUE OF WA(I,J) BY BWT.                WFLO.65
3463             105             LI=3                                                                 WFLO.66
3464             106             DO 19 L=1,2                                                          WFLO.67
3465             106             LI=LI-2 $ L1=LAV(L)                                                  WFLO.68
3466             106             IF (L1 .EQ. 0) GO TO 19                                              WFLO.69
3467             106             I=ING(L)-LI $ LI=L1+LI                                               WFLO.70
3468             106             DO 18 J=1,JMAX                                                       WFLO.71
3469             115        18   WA(I,J)=BWT(J,L1,KA)                                                 WFLO.72
3470             135        19   CONTINUE                                                             WFLO.73
3471             141             CALL WTBUFL (NDSKZ,NDIM2,DA)                                         WFLO.74
3472             151             IF (MSUI .LT. 0) GO TO 50                                            WFLO.75
3473             153             IF (LSTP(1) .EQ. 0) CALL LSTOUT (NAMX,NTPO2,KDAT,IMAX,JMAX,LSBY,     WFLO.76
3474             153            1LFE,DAYX,IB,KA,UA,VA,WA,SA,TA)                                       WFLO.77
3475             175             DO 25 LTP=2,3                                                        WFLO.78
3476             175             IF (LSTP(LTP) .GT. 0) GO TO 25                                       WFLO.79
3477             175             CALL WTBUF (NTAP(LTP),NDIM2,DA)                                      WFLO.80
3478             212        25   CONTINUE                                                             WFLO.81
3479             215             IF (LSTP(4)   .NE. 0) GO TO 50                                       WFLO.82
3480             216      C      ENERGY-SELECTED POINT OUTPUT.                                        WFLO.83
3481             220             MXSL=MSLCT(IB)                                                       WFLO.84
3482             220             DO 30 L=1,MXSL                                                       WFLO.85
3483             220             I=LGLTIJ(1,L,IB) $ J=LGLTIJ(2,L,IB)                                  WFLO.86
3484             220             IF (KA .EQ. 1) PCH(L,IB)=P(I,J)                                      WFLO.87
3485             220             UCH(L,KA,IB)=UA(I,J) $ VCH(L,KA,IB)=VA(I,J) $ WCH(L,KA,IB)=WA(I,J)WFLO.88
3486             220             SCH(L,KA,IB)=SA(I,J) $ TCH(L,KA,IB)=TA(I,J)                          WFLO.89
3487             220        30   CONTINUE                                                             WFLO.90
3488             273        50   CONTINUE                                                             WFLO.91
3489             274             IF (KA .NE. KMAX) GO TO 11                                           WFLO.92
3490             277             IF (IB .NE. NIB) GO TO 10                                            WFLO.93
3491             303             IF (MSUI .LT. 0) RETURN                                              WFLO.94
3492             305             IF (LSTP(4) .EQ. 0) CALL WTBUF (NTAP(4),IDMOD,ENSLT)                 WFLO.95
3493             313             L=1                                                                  WFLO.96
3494             314             DO 55 LTP=2,4                                                        WFLO.97
3495             314             IF (LSTP(LTP) .GT. 0) GO TO 55                                       WFLO.98
3496             314             ITP=ITAP(LTP)                                                        WFLO.99
3497             314             MWT(LTP)=MWT(LTP)+1                                                  WFLO.100
3498             314             PRINT 53, LTP,(NAMT(I,LTP),I=1,3),NTAP(LTP),ITP,MTLAB(ITP,LTP),      WFLO.101
3499             314            1MWT(LTP),DAYX                                                        WFLO.102
3500             366        53   FORMAT (I6,2H) ,3A10,* TAPE*I2,*, TAPE REEL NO.=*I3,*, LABEL=*A10,WFLO.103
3501             366            1*  GROUP-RECORD NO.=*I5,*, DAYS=*F12.4)                              WFLO.104
3502             366             CALL CHGTAPE (LTP,L)                                                 WFLO.105
3503             372        55   CONTINUE                                                             WFLO.106
3504             374             RETURN                                                               WFLO.107
3505             375             END                                                                  WFLO.108

        LENGTH OF ROUTINE    WFLOUT        441

        VARIABLE ASSIGNMENTS
NDSKX  -       0      NDSKZ  -       0      XJVR   -  10015C 1  BT     -    574C 1  DT     -   1754C 1  X      -
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Y       -  53740 2  P       -      30 3  JA      -   11610 3  VA      -   23360 3  WA      -   35130 3  SA      -   46700 3
TA      -  60450 3  BWT     -   72220 3  ENSLT   -      00 4  NAM1    -     460 1  NAM2    -     510 1  NAM3    -     540 1
NAM4    -    570 1  BPT     -      00 0  BUT     -    1540 0  BVT     -   22440 0  BST     -   43340 0  BTT     -   64240 0
BUTM    - 105140 0  BVTM    -  105700 0  BPTEP   -  110440 0  DAYS    -      00 1  KDAT    -      10 1  DIFDAY  -      20 1
DTIME   -     30 1  DAYEND  -      40 1  MAXI    -      50 1  IMAX    -      60 1  JMAX    -      70 1  KMAX    -     100 1
IM1     -    110 1  JM1     -     120 1  IP1     -     130 1  JP1     -     140 1  I1      -     150 1  J1      -     160 1
I2      -    170 1  J2      -     200 1  I       -     210 1  J       -     220 1  K       -     230 1  NCARD1  -     240 1
NCARD   -    250 1  KSYB    -     250 1  INKD    -     270 1  INDEX   -     300 1  ITIL    -     310 1  NAMX    -     410 1
NTPD1   -    440 1  NTPD2   -     450 1  NAMT    -     450 1  NTAP    -     620 1  NRT     -     660 1  KNR     -     720 1
MWT     -    750 1  LOW     -    1020 1  LSTP    -    1060 1  BG      -    1120 1  DOUT    -    1160 1  NOTAP   -    1220 1
ITAP    -   1260 1  MTLAB   -    1320 1  PRTDAY  -    4420 1  LOWP    -    4430 1  LPSTP   -    4440 1  LSTOA   -    4450 1
IDMDA   -   4450 1  IDMD3   -    4470 1  IDMDC   -    4500 1  IDMDD   -    4510 1  NDIM    -    4520 1  NDIM1   -    4530 1
NDIM2   -   4540 1  NDSK1   -    4550 1  NDSK2   -    4560 1  NDSK3   -    4570 1  NDSK4   -    4600 1  NDSK5   -    4610 1
NDSK6   -   4620 1  NDSK7   -    4630 1  NDSK8   -    4640 1  MSUN    -    4650 1  MSUI    -    4660 1  LMIN1   -    4670 1
LMIN2   -   4700 1  IBSCAN  -    4710 1  ASCAN   -    4720 1  EPSL    -    4730 1  ALPHAR  -    4740 1  ALPHA1  -    4750 1
PWGT    -   4760 1  DTIME1  -    4770 1  DTIME2  -    5000 1  MSWP    -    5010 1  MCOUNT  -    5020 1  MSLCT   -    5030 1
LGLTIJ  -   5060 1  XXX     -    5360 1  DAYT    -    5740 1  KDATT   -    5750 1  IBT     -    5760 1  PT      -    5770 1
KT      -  17540 1  UT      -   17550 1  VT      -   31320 1  WT      -   43070 1  ST      -   54640 1  TT      -   66410 1
PPT     - 100150 1  RES     -  111730 1  UTM     -  123500 1  VTM     -  135250 1  DAYB    -      00 2  KDATB   -      10 2
IMAXT   -     20 2  NIB     -      30 2  NIBT    -      40 2  IUNDF   -      50 2  RUNDF   -      60 2  FLAT1   -      70 2
FLAT2   -    100 2  FLONG1  -     110 2  FLONG2  -     120 2  SO      -     130 2  TO      -     140 2  ROO     -     150 2
ALPHA   -    160 2  B       -     170 2  HEATC   -     200 2  PI      -     210 2  RE      -     220 2  G       -     230 2
VISY    -    240 2  SVISY   -     250 2  TVISY   -     260 2  VISZ    -     270 2  SVISZ   -     300 2  TVISZ   -     310 2
POWER   -    320 2  TAREA   -     330 2  JAREA   -     340 2  TVOL    -     350 2  UVOL    -     360 2  TKK     -     370 2
CSTD    -    400 2  CSTE    -     410 2  SECDAY  -     420 2  DXT     -     430 2  DXU     -     760 2  RDXU2   -    1310 2
DYT     -   1640 2  DYU     -    1650 2  RDYU2   -    1660 2  EPSSK   -    1670 2  EPSTK   -    2010 2  RDCRIT  -    2130 2
DZ      -   2250 2  DZMH    -    2370 2  Z       -    2510 2  DEPTH   -    2630 2  BETA    -    2640 2  F       -    3170 2
DG      -   3520 2  AYZT    -    3540 2  AUXY    -    3750 2  AXZT    -    4310 2  AXZU    -   10470 2  AX      -   14650 2
AY      -  21030 2  AZ      -   25210 2  CSX     -   31370 2  CSY     -   35550 2  CSZ     -   41730 2  CTX     -   42050 2
CTY     -  46230 2  CTZ     -   52410 2  VISX    -   52530 2  SVISX   -   53060 2  TVISX   -   53410 2  IBI     -   53740 2
IMX     -  53750 2  IMEF1   -   53760 2  IMEF2   -   53770 2  JMX     -   54000 2  JMEF1   -   54010 2  JMEF2   -   54020 2
LAM     -  54030 2  ING     -   54050 2  INDBL   -   54070 2  INDBR   -   54420 2  LSBY    -   54750 2  IEF1    -   55240 2
IEF2    -  55570 2  IND     -   56130 2  AREAT   -   67670 2  AREAU   -   67700 2  VOLT    -   67710 2  VOLU    -   67720 2
AREATB  -  67730 2  AREAUB  -   67740 2  VOLTB   -   67750 2  VOLUB   -   67760 2  ATXY    -   67770 2  EPD     -  101540 2
BP      -     00 3  DA      -   11600 3  DB      -   72220 3  DC      -  152640 3  DAYSE   -      00 4  KDATSE  -      10 4
FNCE    -     20 4  PCH     -      70 4  JCH     -     230 4  VCH     -    2130 4  WCH     -    4030 4  SCH     -    5730 4
TCH     -   7630 4  ITEM    -   11530 4  VWDS    -   11540 4  LEL     -   11550 4  ENGL    -   11560 4  FAC     -   23060 4
IFL     -  21140 4  IR      -   23220 4  NPLX    -   23230 4  DAYX    -      00 3  KDATX   -      10 3  IB      -      20 3
KA      -  11600 3  LFE     -   411      LI      -   410      L       -   407      L1      -   406      LTP     -   405
KXSL    -    404    ITP     -   403

          SUBROUTINES CALLED
REVOTP     RDBUFL     WTBUFL     GTABOUT     WTBUF     LSTOUT     OUTPTC     CHGTAPE     QBQRSD

          COMMON BLOCKS AND LENGTHS
      -  11220     CMN1    -  14702     CMN2    -  11331     CMN3    -  23326     ENSL    -  2324
   COMPILE TIME =    199    MILLISECS
```

```
CARD.          APPROXIMATE
NUMBER       PROGRAM LOCATION
3506               0            SUBROUTINE FROST (NTPF, SWFR,IDFR)
3507               0            COMMON/QTST/DAYFR,KDATFR,IBFR,TAIR(23,27),QT(23,27),STX(23,27),
3508               0           1STY(23,27), IDMQT,IDMF2,IDMF4,LCMFR(65),LCMFRO,NORDER,PERIOD,MAXFR
3509               0           1,RPERD(2),KIND2,KIND4,CAG1,CAG2,CRB1,CRB2,BB2,BB12,AA2,AA12,BVPT,
3510               0           1BV2,CI2,CI3,CB2,CB3,CB4,CH1,CE1,CTX1,DAYSC,XABF(541)
3511               0            DIMENSION ABFO(5,2,27),ABF(5,4,27),XABFO(271),QATXY(2487)
3512               0            EQUIVALENCE (XABF(1),XABFO(1)),(XABFO(2),ABFO(1)),(DAYFR,QATXY(1))
3513               0            EQUIVALENCE (XABF(1),II),(XABF(2),ABF(1),ABFO(1))
3514               0            DIMENSION NAMFR2(2),NAMFR4(4)
3515               0            COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,NEWP.5
3516               0           1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)NEWP.6
3517               0           2,NAMX(3),NTPO1,NTPO2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)NEWP.7
3518               0           3,LSTP(4),BG(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  NEWP.8
3519               0           3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,NEWP.9
3520               0           3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANNEWP.10
3521               0           4,MSCAN,EPSL,ALPHAR,ALPHAI,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),NEWP.11
3522               0           4LGLTIJ(2,4,3),XXX(30)                                             NEWP.12
3523               0           4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, NEWP.13
3524               0           527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        NEWP.14
3525               0            EQUIVALENCE (XXX(1),NYEARX),(XXX(2),TDAYS)
3526               0            COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,     NEWP.21
3527               0           1FLONG1,FLONG2,SD,TD,RDD,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,    NEWP.22
3528               0           2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,NEWP.23
3529               0           3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITNEWP.24
3530               0           4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  NEWP.25
3531               0           1AJXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  NEWP.26
3532               0           6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( NEWP.27
3533               0           727),SVISX(27),TVISX(27),    IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   NEWP.28
3534               0           8LAN(2),ING(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( NEWP.29
3535               0           923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)NEWP.30
3536               0           1,EPD(23,27)
3537               0            DATA NAMFR2/20H  DD(J)     CLOUD(J) /
3538               0            DATA NAMFR4/40H TAIR(I,J) EA(I,J)   UG(I,J)   VG(I,J)  /
3539               0            DATA NORDER,PERIOD,KIND2,KIND4,IDMF2,IDMF4/2,365.0,2,4,271,541/
3540               0            DATA PRS,HEATL,DNSA,CP/1013.25,595.0,1.23E-3,0.24/
3541               0            DATA CDN,CHEN,IDMDT/1.23E-3, 0.74,2487/
3542               0            DATA ANG,GAMAC,BV,BT,BB1,AA1/15.0,0.9, 4.7,4.7,11.0,7.0/
3543               0            DATA CQI1,CQI2,CQI3,Z10,TVD/0.95,0.74,0.6,1000.0,290.0/
3544               0            DATA CQB1,CQB2,CQB3,CB4,BSIG/0.985,0.39,0.05,0.6,1.354204491E-12/
3545              35            TDAYS=DAYS+DIFDAY $ NYEARX=INT(TDAYS/PERIOD)
3546              35            DAYSC=PERIOD*FLOAT(NYEARX) $ DAYSC=TDAYS-DAYSC
3547              35            DAYSC=DAYSC-DIFDAY
3548              35            MAXFR=2*NORDER+1
3549              35            DO 10 I=1,NORDER
3550              35         10 RPERD(I)=2.0*PI*FLOAT(I)/PERIOD
3551              62            CHN=CDN/CHEN $ CFN=CHN $ CQIO=CQI1/SECDAY
3552              62            CI2=CQIO*CQI2 $ CI3=CQIO*CQI3 $ BVPT=-(BV+BT) $ BV2=-2.0*BV
3553             111            BB2=0.25/CDN**0.8 $ BB12=BB1/BB2 $ AA2=0.83/CDN**0.62$AA12=AA1/AA2
3554             111            CRB1=G*Z10/TVD $ CRB2=0.61*0.622/PRS
3555             125            ANG=PI*ANG/180.0 $ CAG1=GAMAC*COS(ANG) $ CAG2=GAMAC*SIN(ANG)
3556             130            CAG1=CAG1*100.0 $ CAG2=CAG2*100.0
3557             130            CQB1=CQB1*BSIG $ CB2=CQB1*CQB2 $ CB3=CQB1*CQB3
3558             130            CH1=DNSA*CP*CHN $ CE1=DNSA*HEATL*CEN*0.622/PRS $ CTX1=DNSA*CDN
3559             130         21 FORMAT (I4,2I3,5F7.1,5F7.3)
3560             130         23 FORMAT (I4,2I3,10F7.3)
3561             130            KDATFR=KDAT
```

```
CARD          APPROXIMATE
NUMBER        PROGRAM LOCATION
3562            154              IF ( SWFR .GE. 0.0) GO TO 30
3563            155              N=I=0
3564            156              DO 20 J=1,JMAX
3565            156              READ 21, NN,II,JJ, ((ABFD(M,KK,J),M=1,MAXFR),KK=1,KIND2)
3566            212              N=N+1
3567            214              IF (NN .NE. N) GO TO 80
3568            217              IF (II .NE. I) GO TO 80
3569            222              IF (JJ .NE. J) GO TO 80
3570            224          20  CONTINUE
3571            230              IF (IDFR .NE. 0) CALL FRPRT (KDAT,I,JMAX,MAXFR,KIND2,NAMFR2,ABFD)
3572            230        C  ***** WRITE LCM
3573            242              CALL LCMWT (LCMFR0,XABFD,IDMF2)
3574            242        C  ***** WRITE BINARY TAPE
3575            247              CALL WTBUF (NTPF,IDMF2,XABFD)
3576            254              DO 25 I=1,MAXI
3577            254              DO 24 J=1,JMAX
3578            255              KK2=0
3579            255          22  KK1=KK2+1
3580            255              KK2=KK2+2
3581            255              IF (KK2 .GT. KIND4) KK2=KIND4
3582            255              READ 23, NN,II,JJ, ((ABF(M,KK,J),M=1,MAXFR),KK=KK1,KK2)
3583            320              N=N+1
3584            325              IF (NN .NE. N .OR. II .NE. I .OR. JJ .NE. J) GO TO 80
3585            331              IF (KK2 .NE. KIND4) GO TO 22
3586            333          24  CONTINUE
3587            337              IF (IDFR .NE. 0) CALL FRPRT (KDAT,I,JMAX,MAXFR,KIND4,NAMFR4,ABF)
3588            337        C  ***** WRITE LCM
3589            351              CALL LCMWT (LCMFR(I),XABF,IDMF4)
3590            351        C  ***** WRITE BINARY TAPE
3591            360              CALL WTBUF (NTPF,IDMF4,XABF)
3592            365          25  CONTINUE
3593            367              RETURN
3594            370          30  CONTINUE
3595            371              I=0
3596            371              CALL RDBUF (NTPF,IDMF2,XABFD)
3597            400              IF (II .NE. I) GO TO 40
3598            402              CALL LCMWT (LCMFR0,  XABFD,IDMF2)
3599            410              IF (IDFR .NE. 0) CALL FRPRT (KDAT,I,JMAX,MAXFR,KIND2,NAMFR2,ABFD)
3600            422              DO 35 I=1,MAXI
3601            422              CALL RDBUF (NTPF,IDMF4,XABF)
3602            431              IF (II .NE. I) GO TO 40
3603            433              CALL LCMWT (LCMFR(I),XABF,IDMF4)
3604            443              IF (IDFR .NE. 0) CALL FRPRT (KDAT,I,JMAX,MAXFR,KIND4,NAMFR4,ABF)
3605            455          35  CONTINUE
3606            457              RETURN
3607            460          40  PRINT 41, NTPF, I, II
3608            474          41  FORMAT (//25X,5H*****, * FOURIER CONSTANTS READ FROM TAPE*I2,
3609            474             1* IS INCONSISTENT WITH OVERALL I NO.*//30X,* I SHOULD BE*I4,
3610            474             2* BUT THE VALUE READ IS*I4//25X,*------JOB TERMINATES ABNORMALLY---
3611            474             1--*//)
3612            474              CALL EXIT
3613            475              RETURN
3614            475          80  PRINT 81, N,I,J, NN,II,JJ
3615            517          81  FORMAT (/10X,*=====INPUT FOURIER CONSTANTS NOT IN ORDER, JOB TERMI
3616            517             1NATES ABNORMALLY=====*//20X,*N, I, J (SHOULD) =*3I6,*,  BUT INPUT
3617            517             2VALUES OF N, I, J =*3I6/)
```

```
CARD          APPROXIMATE
NUMBER        PROGRAM LOCATION
3618              517          CALL EXIT
3619 .            520          END

       LENGTH OF ROUTINE   FRCST        637

       VARIABLE ASSIGNMENTS
NTPF   -       0     SWFR   -       0     IOFR   -       0     ABFO   -   5027C 0  ABF    -   5027C 0  XABFO  -   5026C 0
DATKY  -      0C 0   NAMFR2 -       0     NAMFR4 -       2     DAYFR  -      0C 0  KDATFR -      1C 0  IBFR   -      2C 0
TAIR   -      3C 0   QT     -   1150C 0   STX    -   2335C 0   STY    -   3512C 0  IDMQT  -   4667C 0  IDMF2  -   4670C 0
IDMF4  -   4671C 0   LCMFR  -   4672C 0   LCMFRD -   4773C 0   NORDER -   4774C 0  PERIOD -   4775C 0  MAXFR  -   4776C 0
PPERD  -   4777C 0   KIND2  -   5001C 0   KIND4  -   5002C 0   CAG1   -   5003C 0  CAG2   -   5004C 0  CRB1   -   5005C 0
CRB2   -   5006C 0   BB2    -   5007C 0   BB12   -   5010C 0   AA2    -   5011C 0  AA12   -   5012C 0  BVPT   -   5013C 0
BV2    -   5014C 0   CI2    -   5015C 0   CI3    -   5016C 0   CB2    -   5017C 0  CB3    -   5020C 0  CB4    -   5021C 0
CH1    -   5022C 0   CE1    -   5023C 0   CTX1   -   5024C 0   DAYSC  -   5025C 0  XABF   -   5026C 0  DAYS   -      0C 1
KDAT   -      1C 1   DIFDAY -      2C 1   DTIME  -      3C 1   DAYEND -      4C 1  MAXI   -      5C 1  IMAX   -      6C 1
JMAX   -      7C 1   KMAX   -     10C 1   IM1    -     11C 1   JM1    -     12C 1  IP1    -     13C 1  JP1    -     14C 1
I1     -     15C 1   J1     -     16C 1   I2     -     17C 1   J2     -     20C 1  I      -     21C 1  J      -     22C 1
K      -     23C 1   NCARD1 -     24C 1   NCARD  -     25C 1   KSYB   -     26C 1  INKD   -     27C 1  INDEX  -     30C 1
ITIL   -     31C 1   NAMX   -     41C 1   NTPD1  -     44C 1   NTPD2  -     45C 1  NAMT   -     46C 1  NTAP   -     62C 1
NRT    -     65C 1   KWR    -     72C 1   MWT    -     76C 1   LDW    -    102C 1  LSTP   -    106C 1  BG     -    112C 1
DOUT   -    116C 1   NOTAP  -    122C 1   ITAP   -    126C 1   MTLAB  -    132C 1  PRTDAY -    442C 1  LDWP   -    443C 1
LPSTP  -    444C 1   LSTDA  -    445C 1   IDMDA  -    446C 1   IDMDB  -    447C 1  IDMDC  -    450C 1  IDMDD  -    451C 1
NDIM   -    452C 1   NDIM1  -    453C 1   NDIM2  -    454C 1   NDSK1  -    455C 1  NDSK2  -    456C 1  NDSK3  -    457C 1
NDSK4  -    460C 1   NDSK5  -    461C 1   NDSK6  -    462C 1   NDSK7  -    463C 1  NDSK8  -    464C 1  MSJN   -    465C 1
MSUI   -    466C 1   LMIN1  -    467C 1   LMIN2  -    470C 1   IBSCAN -    471C 1  MSCAN  -    472C 1  EPSL   -    473C 1
ALPHAR -    474C 1   ALPHA1 -    475C 1   PWGT   -    476C 1   DTIME1 -    477C 1  DTIME2 -    500C 1  HSWP   -    501C 1
MCOUNT -    502C 1   MSLCT  -    503C 1   LGLTIJ -    506C 1   XXX    -    536C 1  DAYT   -    574C 1  KDATT  -    575C 1
IBT    -    576C 1   PT     -    577C 1   KT     -   1754C 1   UT     -   1755C 1  VT     -   3132C 1  WT     -   4307C 1
ST     -   5464C 1   TT     -   6641C 1   PPT    -  10016C 1   RES    -  11173C 1  UTM    -  12350C 1  VTM    -  13525C 1
DAY3   -      0C 2   KDAT3  -      1C 2   IMAXT  -      2C 2   NIB    -      3C 2  NIBT   -      4C 2  IUNDF  -      5C 2
RUNDF  -      6C 2   FLAT1  -      7C 2   FLAT2  -     10C 2   FLONG1 -     11C 2  FLONG2 -     12C 2  SO     -     13C 2
TO     -     14C 2   ROO    -     15C 2   ALPHA  -     16C 2   B      -     17C 2  HEATC  -     20C 2  PI     -     21C 2
PE     -     22C 2   G      -     23C 2   VISY   -     24C 2   SVISY  -     25C 2  TVISY  -     26C 2  VISZ   -     27C 2
SVISZ  -     30C 2   TVISZ  -     31C 2   POWER  -     32C 2   TAREA  -     33C 2  UAREA  -     34C 2  TVOL   -     35C 2
UVOL   -     36C 2   TKK    -     37C 2   CSTQ   -     40C 2   CSTE   -     41C 2  SECDAY -     42C 2  DXT    -     43C 2
DXU    -     76C 2   RDXU2  -    131C 2   DYT    -    164C 2   DYU    -    165C 2  RDYU2  -    166C 2  EPSSK  -    167C 2
EPSTK  -    201C 2   RDCRIT -    213C 2   DZ     -    225C 2   DZMH   -    237C 2  Z      -    251C 2  DEPTH  -    263C 2
BETA   -    264C 2   F      -    317C 2   DG     -    352C 2   AYZT   -    364C 2  AUXY   -    376C 2  AXZT   -    431C 2
AXZU   -   1047C 2   AX     -   1455C 2   AY     -   2103C 2   AZ     -   2521C 2  CSX    -   3137C 2  CSY    -   3555C 2
CSZ    -   4173C 2   CTX    -   4205C 2   CTY    -   4623C 2   CTZ    -   5241C 2  VISX   -   5253C 2  SVISX  -   5306C 2
TVISX  -   5341C 2   IBI    -   5374C 2   IMX    -   5375C 2   IMEF1  -   5376C 2  IMEF2  -   5377C 2  JMX    -   5400C 2
JMEF1  -   5401C 2   JMEF2  -   5402C 2   LAN    -   5403C 2   ING    -   5405C 2  INDBL  -   5407C 2  INDBR  -   5442C 2
LSBY   -   5475C 2   IEF1   -   5524C 2   IEF2   -   5557C 2   IND    -   5612C 2  AREAT  -   6767C 2  AREAU  -   6770C 2
VOLT   -   6771C 2   VOLJ   -   6772C 2   AREATB -   6773C 2   AREAUB -   6774C 2  VOLTB  -   6775C 2  VOLUB  -   6776C 2
ATKY   -   6777C 2   EPD    -  10154C 2   II     -   5026C 0   NYEARX -    536C 1  TDAYS  -    537C 1  PRS    -       6
HEATL  -       7     DWSA   -      10     CP     -      11     CON    -      12     CHEN   -      13     ANG    -      14
GAMAC  -      15     BV     -      16     BT     -      17     BB1    -      20     AA1    -      21     CQI1   -      22
CQI2   -      23     CQI3   -      24     ZIO    -      25     TVO    -      26     CQB1   -      27     CQB2   -      30
CQB3   -      31     BSIG   -      32     CHN    -     536     CEN    -     535     CQIO   -     534     N      -     533
NN     -     532     JJ     -     531     M      -     530     KK     -     527     KK2    -     526     KK1    -     525

       SUBROUTINES CALLED
          COSF      SINF      INPUTC    FRPRT     LCMWT     WTBUF     RDBUF     OUTPTC    EXIT      QBQRSD

       COMMON BLOCKS AND LENGTHS
          6063      CMN1   -  14702     CMN2   -  11331
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AD-A072 564 MICHIGAN UNIV ANN ARBOR DEPT OF ATMOSPHERIC AND OCE--ETC F/G 8/10
A BRIEF DOCUMENTATION OF THE NORPAX OCEAN MODEL,(U)
APR 77 J C HUANG, W SHAW, J S CHING N00014-76-C-0141

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3 OF 3
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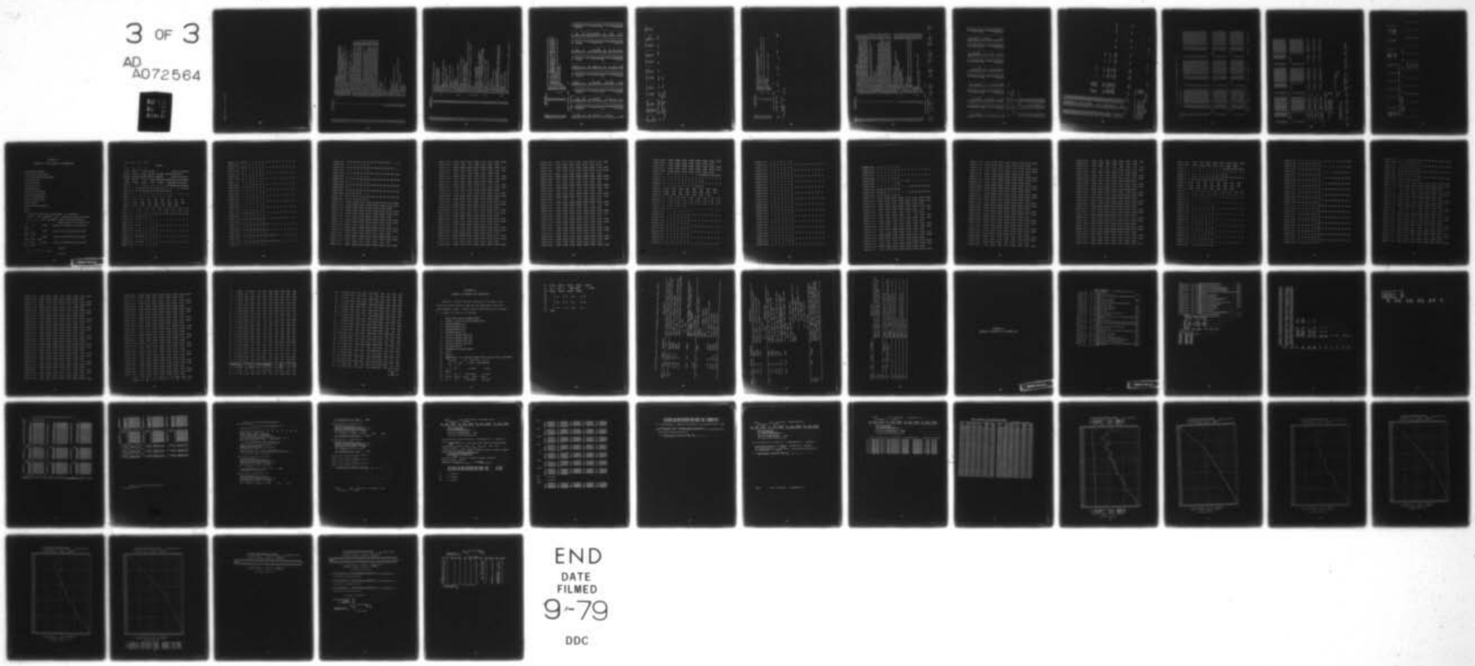

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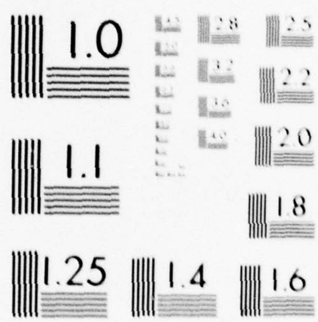


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

COMPILE TIME = 223 MILLISECS

```
  APPROXIMATE
PROGRAM LOCATION
       0              SUBROUTINE QTSTXY (JSWC,T)
       0       C   --- RPERD(N) =2.0*PI*N/PERIOD
       0              COMMON/QTST/DAYFR,KDATFR,IBFR,TAIR(23,27),QT(23,27),STX(23,27),
       0             1STY(23,27), IDMQT,IDMF2,IDMF4,LCMFR(65),LCMFRO,NORDER,PERIOD,MAXFR
       0             1,RPERD(2),KIND2,KIND4,CAG1,CAG2,CRB1,CRB2,BB2,BB12,AA2,AA12,BVPT,
       0             1BV2,CI2,CI3,CB2,CB3,CB4,CH1,CE1,CTX1,DAYSC,XABF(541)
       0              DIMENSION ABFO(5,2,27),ABF(5,4,27),XABFO(271),QATXY(2487)
       0              EQUIVALENCE (XABF(1),XABFO(1)),(XABFO(2),ABFO(1)),(DAYFR,QATXY(1))
       0              EQUIVALENCE (XABF(1),II),(XABF(2),ABF(1),ABFO(1))
       0              DIMENSION FF4(4),FF2(2), CLOUD(27),CLOUD2(27),QO(27),QI(27)
       0              DIMENSION COSNM(5)
       0              EQUIVALENCE (CLOUD(1),CLOUD2(1)),(QI(1),QO(1))
       0              EQUIVALENCE (FF4(1),TAR),(FF4(2),EA),(FF4(3),UG),(FF4(4),VG),
       0             1      (QB,QH,QE),(VHF,VHFA),(QBHE,EA2)
       0              COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,NEWP.5
       0             1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(8)NEWP.6
       0             2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)NEWP.7
       0             3,LSTP(4),BS(4),DOUT(4),NOTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,   NEWP.8
       0             3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,NEWP.9
       0             3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANNEWP.10
       0             4,MSCAN,EPSL,ALPHAR,ALPHA1,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),NEWP.11
       0             4LGLTIJ(2,4,3),XXX(30)                                             NEWP.12
       0             4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23,  NEWP.13
       0             527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        NEWP.14
       0              COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,     NEWP.21
       0             1FLONG1,FLONG2,SO,TO,RDD,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,     NEWP.22
       0             2VISZ,SVISZ,TVISZ,POWER,TAPEA,UAREA,TVOL,UVOL,TKK,CSTO,CSTE,SECDAY,NEWP.23
       0             3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),ROCRITNEWP.24
       0             4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  NEWP.25
       0             1AUXY(27), AXZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  NEWP.26
       0             6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( NEWP.27
       0             727),SVISX(27),TVISX(27),   IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   NEWP.28
       0             8LAN(2),INC(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( NEWP.29
       0             923,27),AREAT,AREAU,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)NEWP.30
       0             1,EPD(23,27)
       0              DIMENSION T(23,27)
       0              EQUIVALENCE (IBI,IB)
       0              DATA COSNM(1)/1.0/
       0              IBFR=IB
     111              IF (JSWC .EQ. 0) GO TO 18
     112              IRE=IRE-1
     112              GO TO 10
     114         18   IRE=0
     114              DAYFR=DAYS
     117              IF(MSUI.EQ.0) GO TO 10
     121              DAYSC=DAYSC+DIFDAY
     125              IF (DAYSC .GT. PERIOD) DAYSC=DAYSC-PERIOD
     127              DO 2 J=1,NORDER
     127              WTJ=RPERD(J)*DAYSC
     127              M=J+1 $ COSNM(M)=COS(WTJ) $ COSNM(M+NORDER)=SIN(WTJ)
     127          2   CONTINUE
     151              CALL LCMRD (LCMFRO,XABFO,IDMF2)
     155              DO 5 J=1,JMAX
     156              DO 4 KK=1,KIND2
     157              FF2(KK)=ABFO(1,KK,J)
     157              DO 3 M=2,MAXFR
```

```
CARD            APPROXIMATE
NUMBER        PROGRAM LOCATION
3676              160      3  FF2(KK)=FF2(KK)+ABFD(M,KK,J)*COSNM(M)
3677              200      4  CONTINUE
3678              203         QD(J)=FF2(1) $ CLOUD(J)=FF2(2)
3679              203         QI(J)=QD(J)*(CI2-CI3*CLOUD(J))
3680              203         CLOUD2(J)=CLOUD(J)*CLOUD(J)
3681              203      5  CONTINUE
3682              215     10  CONTINUE
3683              217         CALL INDINTG (IMAX,JMAX,IND,INDBR,2,ING)
3684              227         IMEF21=IMEF2+1
3685              232         IF (ING(2) .EQ. 0) IMEF21=IMEF2
3686              235         DO 20 I=IMEF1,IMEF21
3687              235         IRE=IRE+1
3688              235         CALL LCMRD (LCMFR(IRE),XABF,IDMF4)
3689              247         DO 20 J=1,JMAX
3690              247         IF (IND(I,J) .LT. 0) GO TO 19
3691              247         DO 16 KK=1,KIND4
3692              256         FF4(KK)=ABF(1,KK,J)
3693              256         DO 15 M=2,MAXFR
3694              257     15  FF4(KK)=FF4(KK)+ABF(M,KK,J)*COSNM(M)
3695              300     16  CONTINUE
3696              303         TWIJ=T(I,J)+TKK $ TAIR(I,J)=TAR $ TAR=TAR+TKK
3697              303         EA2=SQRT(EA)
3698              315         UAR=CAG1*UG-CAG2*VG $ VAR=CAG1*VG+CAG2*UG
3699              315         VH2=UAR*UAR+VAR*VAR $ VH=SQRT(VH2)
3700              325         ES=9.4051-2353.0/TWIJ    $ ES=10.0**ES
3701              336         ESMEA=ES-EA $ RB=1.-CRB2*ESMEA $ RB=TAR*RB-TWIJ $ RB=CRB1*RB/VH2
3702              336         IF (RB) 11,12,13
3703              353     11  FH=1.0+BB12*ALOG(1.0-BB2*RB) $ FA=1.0+AA12*ALOG(1.0-AA2*RB)
3704              360         GO TO 14
3705              363     12  FH=FA=1.0
3706              363         GO TO 14
3707              370     13  FH=EXP(BVPT*RB) $ FA=EXP( BV2*RB)
3708              374     14  TW2= TWIJ*TWIJ      $ TW4=TW2*TW2
3709              374         QB=(CB2-CB3*EA2)*(1.0-CB4*CLOUD2(J))*TW4   $ QBHE=QB
3710              374         VHF=VH*FH $ QH=CH1*VHF*(TWIJ-TAR) $ QBHE=QBHE+QH
3711              374         QE=CE1*VHF*ESMEA    $ QBHE=QBHE+QE $ QT(I,J)=QI(J)-QBHE
3712              374         VHFA=CTX1*FA*VH $ STX(I,J)=VHFA*UAR $ STY(I,J)=VHFA*VAR
3713              374         GO TO 20
3714              431     19  TAIR(I,J)=QT(I,J)=STX(I,J)=STY(I,J)=RUNDF
3715              431     20  CONTINUE
3716              444         CALL INDINTG (IMAX,JMAX,IND,INDBR,2,ING)
3717              455         DO 26 J=1,JMAX
3718              455         JP1=J+1
3719              455         DO 26 I=IMEF1,IMEF2
3720              456         IF (IND(I,J) .LT. 0) GO TO 25
3721              455         IP1=I+1
3722              456         IF (IND(I,J) .GT. 6) GO TO 25
3723              456         STX(I,J)=(STX(I,J)+STX(IP1,J)+STX(I,JP1)+STX(IP1,JP1))*0.25
3724              455         STY(I,J)=(STY(I,J)+STY(IP1,J)+STY(I,JP1)+STY(IP1,JP1))*0.25
3725              456         GO TO 26
3726              456     25  STX(I,J)=STY(I,J)=RUNDF
3727              455     26  CONTINUE
3728              531         IF (MSUI .LT. 0) GO TO 30
3729              534         IF (LSTP(1) .NE. 0) GO TO 28
3730              535         LFE=1
3731              535         NAMX(1)=10HTAIR(I,J) $NAMX(2)=10HIN UNIT -  $NAMX(3)=10HDEGREE C
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CARD           APPROXIMATE
NUMBER      PROGRAM LOCATION
3732              536          CALL GTABOUT (NAMX,NTPD2,KDAT,IMAX,JMAX,DAYS,IB,0,LFE,LSBY,TAIR)
3733              560          LFE=2
3734              560          NAMX(1)=10H QT(I,J)  $NAMX(2)=10HUNIT = CAL $NAMX(3)=10H/CM**2/SEC
3735              560          CALL GTABOUT (NAMX,NTPD2,KDAT,IMAX,JMAX,DAYS,IB,0,LFE,LSBY,QT)
3736              602          NAMX(1)=10HSTX(I,J)  $NAMX(2)=10HIN UNIT -  $NAMX(3)=10HDYNE/CM**2
3737              602          CALL GTABOUT (NAMX,NTPD2,KDAT,IMAX,JMAX,DAYS,IB,0,LFE,LSBY,STX)
3738              623          NAMX(1)=10H STY(I,J)
3739              623          CALL GTABOUT (NAMX,NTPD2,KDAT,IMAX,JMAX,DAYS,IB,0,LFE,LSBY,STY)
3740              642      28  IF (LSTP(4) .NE. 0) GO TO 30
3741              644          CALL WTBUF (NTAP(4),IDMQT,QATXY)
3742              651      30  CONTINUE
3743              651          JSWC=1
3744              651          RETURN
3745              652          END

          LENGTH OF ROUTINE   QTSTXY        730

          VARIABLE ASSIGNMENTS
JSWC    -       0      T       -       0      ABFD    -   5027C 0  ABF     -   5027C 0  XABFD   -   5026C 0  QATXY   -      0C 0
FF4     -       0      FF2     -       4      CLOUD   -       6    CLOUD2  -       6    QD      -      41    QI      -      41
COSVM   -      74      DAYFR   -      0C 0    KDATFR  -      1C 0  IBFR    -      2C 0  TAIR    -      3C 0  QT      -   1160C 0
STX     -   2335C 0    STY     -   3512C 0    IDMQT   -   4667C 0  IDMF2   -   4670C 0  IDMF4   -   4671C 0  LCMFR   -   4672C 0
LCMFRD  -   4773C 0    NORDER  -   4774C 0    PERIOD  -   4775C 0  MAXFR   -   4776C 0  RPERD   -   4777C 0  KIND2   -   5001C 0
KIND4   -   5002C 0    CAG1    -   5003C 0    CAG2    -   5004C 0  CRB1    -   5005C 0  CRB2    -   5006C 0  BB2     -   5007C 0
BB12    -   5010C 0    AA2     -   5011C 0    AA12    -   5012C 0  BVPT    -   5013C 0  BV2     -   5014C 0  CI2     -   5015C 0
CI3     -   5016C 0    CB2     -   5017C 0    CB3     -   5020C 0  CB4     -   5021C 0  CH1     -   5022C 0  CE1     -   5023C 0
CTX1    -   5024C 0    DAYSC   -   5025C 0    XABF    -   5026C 0  DAYS    -      0C 1  KDAT    -      1C 1  DIFDAY  -      2C 1
DTIME   -      3C 1    DAYEND  -      4C 1    MAXI    -      5C 1  IMAX    -      6C 1  JMAX    -      7C 1  KMAX    -     10C 1
IM1     -     11C 1    JM1     -     12C 1    IP1     -     13C 1  JP1     -     14C 1  I1      -     15C 1  J1      -     16C 1
I2      -     17C 1    J2      -     20C 1    I       -     21C 1  J       -     22C 1  K       -     23C 1  NCARD1  -     24C 1
NCARD   -     25C 1    KSYB    -     26C 1    INKD    -     27C 1  INDEX   -     30C 1  ITIL    -     31C 1  NAMX    -     41C 1
NTPD1   -     44C 1    NTPD2   -     45C 1    NAMT    -     46C 1  NTAP    -     62C 1  NRT     -     66C 1  KNR     -     72C 1
MWT     -     75C 1    LDW     -    102C 1    LSTP    -    106C 1  BG      -    112C 1  DOUT    -    116C 1  NOTAP   -    122C 1
ITAP    -    126C 1    MTLAB   -    132C 1    PRTDAY  -    442C 1  LDWP    -    443C 1  LPSTP   -    444C 1  LSTDA   -    445C 1
IDMDA   -    446C 1    IDMDB   -    447C 1    IDMDC   -    450C 1  IDMDD   -    451C 1  NDIM    -    452C 1  NDIM1   -    453C 1
NDIM2   -    454C 1    NDSK1   -    455C 1    NDSK2   -    456C 1  NDSK3   -    457C 1  NDSK4   -    460C 1  NDSK5   -    461C 1
NDSK6   -    462C 1    NDSK7   -    463C 1    NDSK8   -    464C 1  MSUN    -    465C 1  MSUI    -    466C 1  LMIN1   -    467C 1
LMIN2   -    470C 1    IBSCAN  -    471C 1    MSCAN   -    472C 1  EPSL    -    473C 1  ALPHAR  -    474C 1  ALPHA1  -    475C 1
PWGT    -    476C 1    DTIME1  -    477C 1    DTIME2  -    500C 1  MSWP    -    501C 1  MCOUNT  -    502C 1  MSLCT   -    503C 1
LGLTIJ  -    506C 1    XXX     -    536C 1    DAYT    -    574C 1  KDATT   -    575C 1  IBT     -    576C 1  PT      -    577C 1
KT      -   1754C 1    UT      -   1755C 1    VT      -   3132C 1  WT      -   4307C 1  ST      -   5464C 1  TT      -   6641C 1
PPT     -  10016C 1    RES     -  11173C 1    UTM     -  12350C 1  VTM     -  13525C 1  DAYB    -      0C 2  KDATB   -      1C 2
IMAXT   -      2C 2    NIB     -      3C 2    NIBT    -      4C 2  IUNDF   -      5C 2  RUNDF   -      6C 2  FLAT1   -      7C 2
FLAT2   -     10C 2    FLONG1  -     11C 2    FLONG2  -     12C 2  SO      -     13C 2  TO      -     14C 2  ROO     -     15C 2
ALPHA   -     16C 2    B       -     17C 2    HEATC   -     20C 2  PI      -     21C 2  RE      -     22C 2  G       -     23C 2
VISY    -     24C 2    SVISY   -     25C 2    TVISY   -     26C 2  VISZ    -     27C 2  SVISZ   -     30C 2  TVISZ   -     31C 2
POWER   -     32C 2    TAREA   -     33C 2    UAREA   -     34C 2  TVOL    -     35C 2  UVOL    -     36C 2  TKK     -     37C 2
CSTQ    -     40C 2    CSTE    -     41C 2    SECDAY  -     42C 2  DXT     -     43C 2  DXU     -     76C 2  RDXU2   -    131C 2
DYT     -    164C 2    DYU     -    165C 2    RDYU2   -    166C 2  EPSSK   -    167C 2  EPSTK   -    201C 2  ROCRIT  -    213C 2
DZ      -    225C 2    DZMH    -    237C 2    Z       -    251C 2  DEPTH   -    263C 2  BETA    -    264C 2  F       -    317C 2
DG      -    352C 2    AYZT    -    364C 2    AJXY    -    376C 2  AXZT    -    431C 2  AXZU    -   1047C 2  AX      -   1465C 2
AY      -   2103C 2    AZ      -   2521C 2    CSX     -   3137C 2  CSY     -   3555C 2  CSZ     -   4173C 2  CTX     -   4205C 2
CTY     -   4623C 2    CTZ     -   5241C 2    VISX    -   5253C 2  SVISX   -   5306C 2  TVISX   -   5341C 2  IBI     -   5374C 2
IMX     -   5375C 2    IMEF1   -   5376C 2    IMEF2   -   5377C 2  JMX     -   5400C 2  JMEF1   -   5401C 2  JMEF2   -   5402C 2
LAN     -   5403C 2    ING     -   5405C 2    INDBL   -   5407C 2  INDBR   -   5442C 2  LSBY    -   5475C 2  IEF1    -   5524C 2
IEF2    -   5557C 2    IND     -   5612C 2    AREAT   -   6767C 2  AREAU   -   6770C 2  VOLT    -   6771C 2  VOLU    -   6772C 2
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AREATB -   6773C 2  AREAJB -    6774C 2  VOLTB   -    6775C 2  VOLUB   -    6776C 2  ATXY   -    6777C 2  EPD     -  10154C 2
II     -   5026C 0  TAR    -       0     EA      -       1     UG      -       2     VG     -       3     QB      -     101
QH     -    101     QE     -     101     VHF     -     102     VHFA    -     102     QBHE   -     103     EA2     -     103
IB     -   5374C 2  IRE    -     701     WTJ     -     700     M       -     677     KK     -     676     IMEF21  -     675
TWIJ   -    674     UAR    -     673     VAR     -     672     VH2     -     671     VH     -     670     ES      -     667
ESMEA  -    666     RB     -     665     FH      -     664     FA      -     663     TW2    -     662     TW4     -     661
LFE    -    660

         SUBROUTINES CALLED
COSF       SINF       LCMRD      INDINTG    SQRTF      RBAREX     LOGF       EXPF       GTABOUT    WTBUF      QBQRSD

         COMMON BLOCKS AND LENGTHS
QTST   -    6063    CMN1   -   14702     CMN2    -   11331
    COMPILE TIME =     303     MILLISECS
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CARD              APPROXIMATE
NUMBER          PROGRAM LOCATION
3746                   0             SUBROUTINE FRPRT (KDAT,I,JMAX,MAXFR,KIND,NAMFR,XAB)
3747                   0             DIMENSION XAB(MAXFR,KIND,JMAX),NAMFR(KIND)
3748                   0             PRINT 10, KDAT, I
3749                  13        10   FORMAT (// 10X,*DATE -- *A10,12X,*INPUT FOURIER CONSTANTS FOR OVER
3750                  13           1 ALL I =*I4/)
3751                  13        11   FORMAT (/9X,I4,2X,A10,I4,1X,7(I5,1H),F8.3)/(30X,7(I5,1H),F8.3)))
3752                  13             DO 20 K=1,KIND
3753                  13             DO 20 M=1,MAXFR
3754                  14        20   PRINT 11,I,NAMFR(K),M, (J,XAB(M,K,J),J=1,JMAX)
3755                  53             RETURN
3756                  54             END

          LENGTH OF ROUTINE    FRPRT        127

          VARIABLE ASSIGNMENTS
KDAT    -      0    I     -      0    JMAX    -      0    MAXFR   -      0    KIND    -      0    NAMFR   -      0
XAB     -      0    K     -     67    M       -     66    J       -     65

          SUBROUTINES CALLED
OUTPTC     OBORSD
    COMPILE TIME =     19     MILLISECS
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                 APPROXIMATE
                 PROGRAM LOCATION
                      0            SUBROUTINE CALCKD (LTYPE,NDSKR,NDSKW)                               CALD.2
                      0      C  ========== BEGINING OF DIMENSION CHANGE  ==========                   CALD.3
                      0            COMMON/CMN1/DAYS,KDAT,DIFDAY,DTIME,DAYEND,MAXI,IMAX,JMAX,KMAX,IM1,CALD.4
                      0           1JM1,IP1,JP1,I1,J1,I2,J2,I,J,K,NCARD1,NCARD,KSYB,INKD,INDEX,ITIL(3)CALD.5
                      0           2,NAMX(3),NTPD1,NTPD2,NAMT(3,4),NTAP(4),NRT(4),KNR(4),MWT(4),LDW(4)CALD.6
                      0           3,LSTP(4),BS(4),DOUT(4),NDTAP(4),ITAP(4),MTLAB(50,4),PRTDAY,LDWP,  CALD.7
                      0           3LPSTP,LSTDA,IDMDA,IDMDB,IDMDC,IDMDD,NDIM,NDIM1,NDIM2, NDSK1,NDSK2,CALD.8
                      0           3NDSK3,NDSK4,NDSK5,NDSK6,NDSK7,NDSK8, MSUN,MSUI, LMIN1,LMIN2,IBSCANCALD.9
                      0           4,MSCAN,EPSL,ALPHAR,ALPHAI,PWGT,DTIME1,DTIME2,MSWP,MCOUNT,MSLCT(3),CALD.10
                      0           4LGLTIJ(2,4,3),XXX(30)                                               CALD.11
                      0           4,DAYT,KDATT,IBT,PT(23,27),KT,UT(23,27),VT(23,27),WT(23,27),ST(23, CALD.12
                      0           527),TT(23,27), PPT(23,27),RES(23,27),UTM(23,27),VTM(23,27)        CALD.13
                      0            DIMENSION XUVR(2484)                                                CALD.14
                      0            EQUIVALENCE (PPT(1),XUVR(1))                                        CALD.15
                      0            DIMENSION BT(624),DT(3106)                                          CALD.16
                      0            EQUIVALENCE (DAYT,BT(1)),(KT,DT(1))                                 CALD.17
                      0            COMMON/CMN2/DAYB,KDATB,IMAXT,NIB,NIBT,IUNDF,RUNDF,FLAT1,FLAT2,      CALD.18
                      0           1FLONG1,FLONG2,SO,TO,RDO,ALPHA,B,HEATC,PI,RE,G,VISY,SVISY,TVISY,    CALD.19
                      0           2VISZ,SVISZ,TVISZ,POWER,TAREA,UAREA,TVOL,UVOL,TKK,CSTQ,CSTE,SECDAY,CALD.20
                      0           3DXT(27),DXU(27),RDXU2(27),DYT,DYU,RDYU2,EPSSK(10),EPSTK(10),RDCRITCALD.21
                      0           4(10),DZ(10),DZMH(10),Z(10),DEPTH,BETA(27),F(27),DG(10),AYZT(10),  CALD.22
                      0           1AUXY(27), AKZT(27,10),AXZU(27,10),AX(27,10),AY(27,10),AZ(27,10),  CALD.23
                      0           6CSX(27,10),CSY(27,10),CSZ(10),CTX(27,10),CTY(27,10),CTZ(10),VISX( CALD.24
                      0           727),SVISX(27),TVISX(27),   IBI,IMX,IMEF1,IMEF2,JMX,JMEF1,JMEF2,   CALD.25
                      0           8LAN(2),INC(2),INDBL(27),INDBR(27),LSBY(23),IEF1(27),IEF2(27),IND( CALD.26
                      0           923,27),AREAT,AREAJ,VOLT,VOLU,AREATB,AREAUB,VOLTB,VOLUB,ATXY(23,27)CALD.27
                      0           1,EPD(23,27)
                      0            DIMENSION X(2812),Y(2013)
                      0            EQUIVALENCE (DAYB,X(1)),(IBI,Y(1))                                  CALD.30
                      0      C  *********** ENDING OF DIMENSION CHANGE  ****************               CALD.33
                      5            CALL REWDTP (NDSK5) $ CALL REWDTP (NDSKR)                           CALD.34
                     11            IF (NDSKW .NE. 0) CALL REWDTP (NDSKW)                               CALD.35
                     15       10   CALL RDBUFL (NDSK5,IDMDB,Y)                                         CALD.36
                     22            CALL RDBUFL (NDSKR,IDMDC,XUVR)                                      CALD.37
                     27            GO TO (1,2,3) LTYPE                                                 CALD.38
                     40        1   CONTINUE                                                            CALD.39
                     40            KPP=0 $ LFE=2                                                       CALD.40
                     40            NAMX(1)=10H PPT(I,J)                                                CALD.41
                     40            CALL STABOUT (NAMX,NTPD1,KDAT,IMAX,JMAX,DAYS,IBI,KPP,LFE,LSBY,PPT)CALD.42
                     60            NAMX(1)=10H RES(I,J)                                                CALD.43
                     60            CALL STABOUT (NAMX,NTPD1,KDAT,IMAX,JMAX,DAYS,IBI,KPP,LFE,LSBY,RES)CALD.44
                     75            GO TO 20                                                            CALD.45
                     76        2   CONTINUE                                                            CALD.46
                     77            GO TO 20                                                            CALD.47
                     77        3   CONTINUE                                                            CALD.48
                    101       20   IF (NDSKW .NE. 0) CALL WTBUFL (NDSKW,IDMDC,XUVR)                    CALD.49
                    110            IF (IBI .NE. NIB) GO TO 10                                          CALD.50
                    112            RETURN                                                              CALD.51
                    112            END                                                                 CALD.52

        LENGTH OF ROUTINE   CALCKD        135

        VARIABLE ASSIGNMENTS
LTYPE  -       0    NDSKR  -       0    NDSKW  -       0    XUVR   -  10016C 0  BT     -   5740 0  DT     -   1754C 0
X      -    0C 1    Y      -   5374C 1  DAYS   -    0C 0    KDAT   -     1C 0   DIFDAY -     2C 0  DTIME  -     3C 0
DAYEND -    4C 0    MAXI   -      5C 0  IMAX   -    6C 0    JMAX   -     7C 0   KMAX   -    10C 0  IM1    -    11C 0
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JM1     -     12C 0  IP1     -     13C 0  JP1     -     14C 0  I1      -     15C 0  J1      -     16C 0  I2      -     17C 0
J2      -     23C 0  I       -     21C 0  J       -     22C 0  K       -     23C 0  NCARD1  -     24C 0  NCARD   -     25C 0
KSYB    -     26C 0  INKD    -     27C 0  INDEX   -     30C 0  ITIL    -     31C 0  NAMX    -     41C 0  NTPD1   -     44C 0
NTPD2   -     45C 0  NAMT    -     46C 0  NTAP    -     62C 0  NRT     -     66C 0  KNR     -     72C 0  MWT     -     76C 0
LDW     -    102C 0  LSTP    -    106C 0  BG      -    112C 0  DOUT    -    116C 0  NDTAP   -    122C 0  ITAP    -    126C 0
MTLAB   -    132C 0  PRTDAY  -    442C 0  LDWP    -    443C 0  LPSTP   -    444C 0  LSTDA   -    445C 0  IDMDA   -    446C 0
IDMDB   -    447C 0  IDMDC   -    450C 0  IDMDD   -    451C 0  NDIM    -    452C 0  NDIM1   -    453C 0  NDIM2   -    454C 0
NDSK1   -    455C 0  NDSK2   -    456C 0  NDSK3   -    457C 0  NDSK4   -    460C 0  NDSK5   -    461C 0  NDSK6   -    462C 0
NDSK7   -    463C 0  NDSK8   -    464C 0  MSUN    -    465C 0  MSUI    -    466C 0  LMIN1   -    467C 0  LMIN2   -    470C 0
IBSCAN  -    471C 0  MSCAN   -    472C 0  EPSL    -    473C 0  ALPHAR  -    474C 0  ALPHA1  -    475C 0  PWST    -    476C 0
DTIME1  -    477C 0  DTIME2  -    500C 0  MSWP    -    501C 0  MCOUNT  -    502C 0  MSLCT   -    503C 0  LGLTIJ  -    506C 0
XXX     -    536C 0  DAYT    -    574C 0  KDATT   -    575C 0  IBT     -    576C 0  PT      -    577C 0  KT      -   1754C 0
JT      -   1755C 0  VT      -  31320C 0  WT      -  43070C 0  ST      -   5464C 0  TT      -   6641C 0  PPT     -  10016C 0
RES     - 111173C 0  UTM     - 123530C 0  VTM     - 135250C 0  DAYB    -      0C 1  KDATB   -      1C 1  IMAXT   -      2C 1
NIE     -      3C 1  NIBT    -      4C 1  IUNDF   -      5C 1  RUNDF   -      6C 1  FLAT1   -      7C 1  FLAT2   -     10C 1
FLONG1  -     11C 1  FLONG2  -     12C 1  SO      -     13C 1  TO      -     14C 1  RUO     -     15C 1  ALPHA   -     16C 1
B       -     17C 1  HEATC   -     20C 1  PI      -     21C 1  RE      -     22C 1  G       -     23C 1  VISY    -     24C 1
SWISY   -     25C 1  TWISY   -     26C 1  VISZ    -     27C 1  SWISZ   -     30C 1  TVISZ   -     31C 1  POWER   -     32C 1
TAREA   -     33C 1  UAREA   -     34C 1  TVOL    -     35C 1  UVOL    -     36C 1  TKK     -     37C 1  CSTO    -     40C 1
CSTE    -     41C 1  SECDAY  -     42C 1  DXT     -     43C 1  DXU     -     76C 1  RDXU2   -    131C 1  DYT     -    164C 1
DYU     -    165C 1  RDYU2   -    166C 1  EPSSK   -    167C 1  EPSTK   -    201C 1  ROCKIT  -    213C 1  DZ      -    225C 1
DZMM    -    237C 1  Z       -    251C 1  DEPTH   -    263C 1  BETA    -    264C 1  F       -    317C 1  DG      -    352C 1
AYZT    -    364C 1  AUXY    -    376C 1  AXZT    -    431C 1  AXZU    -   1047C 1  AX      -   1465C 1  AY      -   2103C 1
AZ      -   2521C 1  CSX     -   3137C 1  CSY     -   3555C 1  CSZ     -   4173C 1  CTX     -   4205C 1  CTY     -   4623C 1
CTZ     -   5241C 1  VISX    -   5253C 1  SWISX   -   5306C 1  TVISX   -   5341C 1  IBI     -   5374C 1  IMX     -   5375C 1
IMEF1   -   5376C 1  IMEF2   -   5377C 1  JMX     -   5400C 1  JMEF1   -   5401C 1  JMEF2   -   5402C 1  LAN     -   5403C 1
ING     -   5405C 1  INDBL   -   5407C 1  INDBR   -   5442C 1  LSBY    -   5475C 1  IEF1    -   5524C 1  IEF2    -   5557C 1
IND     -   5612C 1  AREAT   -   6757C 1  AREAU   -   6770C 1  VOLT    -   6771C 1  VOLU    -   6772C 1  AREATB  -   6773C 1
AREAUB  -   6774C 1  VOLTB   -   6775C 1  VOLUB   -   6776C 1  ATXY    -   6777C 1  EPD     -  10154C 1  KPP     -    121
LFE     -    120

          SUBROUTINES CALLED
REWDTP  . RDBJFL     GTABOUT    WTBJFL     DBGKSD

          COMMON BLOCKS AND LENGTHS
CMN1    -  14702     CMN2    -  11331
     COMPILE TIME =     75    MILLISECS

  PROGRAM SPACE IS 137726

ORIGIN     ENTRY POINTS AND LOCATIONS
 11224      TTCNLNZ  11236
 71255      CSTOUT   71255
 71314      FLDYST   71341
 72302      RDBJF    72302
 72411      WTBUF    72411
 72520      REQLCM   72520
101122      REWDTP  101122
101136      RDBJFL  101136
101166      WTBJFL  101166
101216      GRDCST  101222
103117      CRDINP  103122
103351      LSTCSTI 103351
105065      INDTABL 105065
105352      CHGTAPE 105364
105716      GTABOUT 105741
106247      LSTOUT  106247
106476      PRTENGX 106514
106777      DATPLT  106777
107163      MPLOT   107224
110316      PRTOJK  110316
```

```
112170     INDINTG 112170
112246     MAINCL  112246
112650     ACALK32 112650
113215     CMPTA   113217
115060     BINCPMA 115060
115142     ZERDBF  115142
115225     NONLIN  115230
116431     FCALK32 116431
116773     CMPTF   116773
120622     QTEMPF  120622
120670     RELAX   120670
121476     CNTX    121476
122350     ADVCD   122361
122710     CALCAJ  122722
123400     MUVCAL  123400
124773     MFLOUT  124773
125434     FRCST   125467
126273     QTSTXY  126377
127223     FRPRT   127223
127352     CALCKD  127352
127507     Q8QERR  127507
127521     Q8QIOU  127521     IJ903    127744
127754     Q8QRSD  127767     NUMP     130000
130003     ALOG    130004     LOGF     130004
130046     EXIT    130061     END      130061     STOP    130051
130066     EXP     130076     EXPF     130076
130146     INPUTC  130146
130571     KODER   130571
131621     KRAKER  131621
132421     OUTPTC  132421
133052     COS     133052     SIN      133056     COSF    133052     SINF    133056
133137     SQRT    133137     SQRTF    133137
133170     ALOG10  133171
133244     BACKSP  133244     REWINM   133321     IFENDF  133331
133370     BUFFEI  133370     BUFFEO   133412     LENGTHF 133450     IOCHEK  133470
133655     CLOCKF  133652     DATEF    133655
133667     LCMRD   133724     LCMWT    133727     LCMREQ  133667
133744     NEWVOL  133747     NEWLAB   133744
135033     FRSTPT  135053     VECTOR   135126     POINT   135137     CURVE   135150     LINE    135211     Q8QTRN  135231
           Q8QP42  135311     Q8QFLB   135324     Q8QMRB  135374     Q8QERP  135450
136403     OUTPTS  136403
136676     FRAME   136676
136745     OPTN    136753
137134     PKRI    137140
137457     PWRT    137457
137514     Q8QSOA  137514
137523     RBAREX  137542
137645     ULIBER  137645

    COMMON BLOCKS     LOCATION
                  4       CMN1      14570     CMN2     31472     CMN3     43023     NLCM     66351     ENSL     66731
           QTST       73037       CPL      107107     Q8QPPC  135461


OVERALL CORE USE STATISTICS   (DECIMAL)

THE MAXIMUM SCM IS                54144
THE PROGRAM CURRENTLY USES        49126
THE LOADING PROCESS USED          52258
THE MAXIMUM LCM IS               449600
THE PROGRAM CURRENTLY USES        52965
 LCM AREA MAP BY BUFFER TYPE
         MISC           185  SYSIOU           6  PR            2048  RANFO            64  SYSSAT          512
         SYSOMI        1024  SYSSCM       49126
```

********** LCM ADDRESS TABLE FOR BOTH BKY-FTN AND NCAR SYSTEMS **********

LCMFRO = 0 00000000000000000000

LCMFR(I) =

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1) | 271 | 00000000000000000417 | 2) | 812 | 00000000000000001454 | 3) | 1353 | 00000000000000002511 |
| 4) | 1894 | 00000000000000003546 | 5) | 2435 | 00000000000000004603 | 6) | 2976 | 00000000000000005640 |
| 7) | 3517 | 00000000000000006675 | 8) | 4058 | 00000000000000007732 | 9) | 4599 | 00000000000000010767 |
| 10) | 5140 | 00000000000000012024 | 11) | 5681 | 00000000000000013061 | 12) | 6222 | 00000000000000014116 |
| 13) | 6763 | 00000000000000015153 | 14) | 7304 | 00000000000000016210 | 15) | 7845 | 00000000000000017245 |
| 16) | 8386 | 00000000000000020302 | 17) | 8927 | 00000000000000021337 | 18) | 9468 | 00000000000000022374 |
| 19) | 10009 | 00000000000000023431 | 20) | 10550 | 00000000000000024466 | 21) | 11091 | 00000000000000025523 |
| 22) | 11632 | 00000000000000026560 | 23) | 12173 | 00000000000000027615 | 24) | 12714 | 00000000000000030652 |
| 25) | 13255 | 00000000000000031707 | 26) | 13796 | 00000000000000032744 | 27) | 14337 | 00000000000000034001 |
| 28) | 14878 | 00000000000000035036 | 29) | 15419 | 00000000000000036073 | 30) | 15960 | 00000000000000037130 |
| 31) | 16501 | 00000000000000040165 | 32) | 17042 | 00000000000000041222 | 33) | 17583 | 00000000000000042257 |
| 34) | 18124 | 00000000000000043314 | 35) | 18665 | 00000000000000044351 | 36) | 19206 | 00000000000000045406 |
| 37) | 19747 | 00000000000000046443 | 38) | 20288 | 00000000000000047500 | 39) | 20829 | 00000000000000050535 |
| 40) | 21370 | 00000000000000051572 | 41) | 21911 | 00000000000000052627 | 42) | 22452 | 00000000000000053664 |
| 43) | 22993 | 00000000000000054721 | 44) | 23534 | 00000000000000055756 | 45) | 24075 | 00000000000000057013 |
| 46) | 24616 | 00000000000000060050 | 47) | 25157 | 00000000000000061105 | 48) | 25698 | 00000000000000062142 |
| 49) | 26239 | 00000000000000063177 | 50) | 26780 | 00000000000000064234 | 51) | 27321 | 00000000000000065271 |
| 52) | 27862 | 00000000000000066326 | 53) | 28403 | 00000000000000067363 | 54) | 28944 | 00000000000000070420 |
| 55) | 29485 | 00000000000000071455 | 56) | 30026 | 00000000000000072512 | 57) | 30567 | 00000000000000073547 |
| 58) | 31108 | 00000000000000074604 | 59) | 31649 | 00000000000000075641 | 60) | 32190 | 00000000000000076676 |
| 61) | 32731 | 00000000000000077733 | 62) | 33272 | 00000000000000100770 | 63) | 33813 | 00000000000000102025 |
| 64) | 34354 | 00000000000000103062 | 65) | 34895 | 00000000000000104117 | | | |

LCM NAME REQUEST --- L, LCNT(L), IRMX = 1 0 33

| I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. | I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. | I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. |
|---|---|---|---|---|---|---|---|---|
| 1) | 35436 | 00000000000000105154 | 2) | 36060 | 00000000000000106334 | 3) | 39166 | 00000000000000114376 |
| 4) | 42272 | 00000000000000122440 | 5) | 45378 | 00000000000000130502 | 6) | 48484 | 00000000000000136544 |
| 7) | 51590 | 00000000000000144606 | 8) | 54696 | 00000000000000152650 | 9) | 57802 | 00000000000000160712 |
| 10) | 60908 | 00000000000000166754 | 11) | 64014 | 00000000000000175016 | 12) | 67120 | 00000000000000203060 |
| 13) | 67744 | 00000000000000204240 | 14) | 70850 | 00000000000000212302 | 15) | 73956 | 00000000000000220344 |
| 16) | 77062 | 00000000000000226406 | 17) | 80168 | 00000000000000234450 | 18) | 83274 | 00000000000000242512 |
| 19) | 86380 | 00000000000000250554 | 20) | 89486 | 00000000000000256616 | 21) | 92592 | 00000000000000264660 |
| 22) | 95698 | 00000000000000272722 | 23) | 98804 | 00000000000000300764 | 24) | 99428 | 00000000000000302144 |
| 25) | 102534 | 00000000000000310206 | 26) | 105640 | 00000000000000316250 | 27) | 108746 | 00000000000000324312 |
| 28) | 111852 | 00000000000000332354 | 29) | 114958 | 00000000000000340416 | 30) | 118064 | 00000000000000346460 |
| 31) | 121170 | 00000000000000354522 | 32) | 124276 | 00000000000000362564 | 33) | 127382 | 00000000000000370626 |

LCM NAME REQUEST --- L, LCNT(L), IRMX = 2 0 33

| I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. | I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. | I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. |
|---|---|---|---|---|---|---|---|---|
| 1) | 130488 | 00000000000000376670 | 2) | 131112 | 00000000000000400050 | 3) | 134218 | 00000000000000406112 |
| 4) | 137324 | 00000000000000414154 | 5) | 140430 | 00000000000000422216 | 6) | 143536 | 00000000000000430260 |
| 7) | 146642 | 00000000000000436322 | 8) | 149748 | 00000000000000444364 | 9) | 152854 | 00000000000000452426 |
| 10) | 155960 | 00000000000000460470 | 11) | 159066 | 00000000000000466532 | 12) | 162172 | 00000000000000474574 |
| 13) | 162796 | 00000000000000475754 | 14) | 165902 | 00000000000000504016 | 15) | 169008 | 00000000000000512060 |
| 16) | 172114 | 00000000000000520122 | 17) | 175220 | 00000000000000526164 | 18) | 178326 | 00000000000000534226 |
| 19) | 181432 | 00000000000000542270 | 20) | 184538 | 00000000000000550332 | 21) | 187644 | 00000000000000556374 |
| 22) | 190750 | 00000000000000564436 | 23) | 193856 | 00000000000000572500 | 24) | 194480 | 00000000000000573660 |
| 25) | 197586 | 00000000000000601722 | 26) | 200692 | 00000000000000607764 | 27) | 203798 | 00000000000000616026 |
| 28) | 206904 | 00000000000000624070 | 29) | 210010 | 00000000000000632132 | 30) | 213116 | 00000000000000640174 |
| 31) | 216222 | 00000000000000646236 | 32) | 219328 | 00000000000000654300 | 33) | 222434 | 00000000000000662342 |

LCM NAME REQUEST --- L, LCNT(L), IRMX = 3 0 33

| I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. | I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. | I | LCMNAM(I,L) | LCMNAM(I,L) IN OCT. |
|---|---|---|---|---|---|---|---|---|

```
 1)    225540  0000000000000670404    2)    226164  0000000000000671564    3)    229270  0000000000000677626
 4)    232376  0000000000000705670    5)    235482  0000000000000713732    6)    238588  0000000000000721774
 7)    241694  0000000000000730036    8)    244800  0000000000000736100    9)    247906  0000000000000744142
10)    251012  0000000000000752204   11)    254118  0000000000000760246   12)    257224  0000000000000766310
13)    257848  0000000000000767470   14)    260954  0000000000000775532   15)    264060  0000000000001003574
16)    267166  0000000000001011636   17)    270272  0000000000001017700   18)    273378  0000000000001025742
19)    276484  0000000000001034004   20)    279590  0000000000001042046   21)    282696  0000000000001050110
22)    285802  0000000000001056152   23)    288908  0000000000001064214   24)    289532  0000000000001065374
25)    292638  0000000000001073436   26)    295744  0000000000001101500   27)    298850  0000000000001107542
28)    301956  0000000000001115604   29)    305062  0000000000001123646   30)    308168  0000000000001131710
31)    311274  0000000000001137752   32)    314380  0000000000001146014   33)    317486  0000000000001154056

    LCM NAME REQUEST --- L, LCNT(L), IRMX =      4      0     33

 I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.
 1)          0  00000000000000000000    2)          0  00000000000000000000    3)          0  00000000000000000000
 4)          0  00000000000000000000    5)          0  00000000000000000000    6)          0  00000000000000000000
 7)          0  00000000000000000000    8)          0  00000000000000000000    9)          0  00000000000000000000
10)          0  00000000000000000000   11)          0  00000000000000000000   12)          0  00000000000000000000
13)          0  00000000000000000000   14)          0  00000000000000000000   15)          0  00000000000000000000
16)          0  00000000000000000000   17)          0  00000000000000000000   18)          0  00000000000000000000
19)          0  00000000000000000000   20)          0  00000000000000000000   21)          0  00000000000000000000
22)          0  00000000000000000000   23)          0  00000000000000000000   24)          0  00000000000000000000
25)          0  00000000000000000000   26)          0  00000000000000000000   27)          0  00000000000000000000
28)          0  00000000000000000000   29)          0  00000000000000000000   30)          0  00000000000000000000
31)          0  00000000000000000000   32)          0  00000000000000000000   33)          0  00000000000000000000

    LCM NAME REQUEST --- L, LCNT(L), IRMX =      5      0      3

 I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.
 1)     320592  0000000000001162120    2)     322605  0000000000001166055    3)     324618  0000000000001172012

    LCM NAME REQUEST --- L, LCNT(L), IRMX =      6      0      3

 I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.
 1)     326631  0000000000001175747    2)     329115  0000000000001202633    3)     331599  0000000000001207517

    LCM NAME REQUEST --- L, LCNT(L), IRMX =      7      0      3

 I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.
 1)     326631  0000000000001175747    2)     329115  0000000000001202633    3)     331599  0000000000001207517
-END-FILE ON INPUT

                   TERMINATION DATE = 12/31/76
                   TERMINATION TIME = 15/21/23

         TOTAL CPU TIME IN MILLISECONDS =      7827
               PPU TIME IN MILLISECONDS =      1369
                          PAGES PRINTED =       117
                   TOTAL RESOURCES USED =      5.70

                                               DISK BLOCK USAGE SUMMARY
                                      ODD UNITS                         EVEN UNITS
                                       DISK 0                             DISK 1
          LIMIT ON BLOCKS ALLOWED        4095                               4095
          MAXIMUM BLOCKS USED               4                                  1
          PLIB BLOCKS FOR THIS PROJECT      2

                                               TAPE ACTIVITY SUMMARY
TAPE  PHYSICAL  CHANNEL PARITY ERRORS    READ     WRITE    RECORDS    WORDS    FILE MARKS RECORDS    WORDS  FILE MARKS
LABEL   UNIT    ON CHAN 10,  CHAN 11.   ERRORS   ERRORS    READ       READ       READ     WRITTEN   WRITTEN  WRITTEN

 RD D    0            0        0          0        0         1         1?    0          0          0       0
```

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SLIB | D | 1 | 0 | 0 | 0 | 0 | 15 | 48379 | 0 | 0 | 0 | 0 |
| PLIB | D | 1 | 0 | 0 | 0 | 0 | 9 | 17168 | 0 | 0 | 0 | 0 |
| SSCR | B | 0 | 0 | 0 | 0 | 0 | 161 | 41216 | 0 | 161 | 41216 | 0 |
| SSCR | D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PR | D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 28672 | 0 |
| LGD | B | 0 | 0 | 0 | 0 | 0 | 138 | 51552 | 2 | 69 | 25776 | 0 |
| LGD | D | 1 | 0 | 0 | 0 | 0 | 6 | 61440 | 0 | 3 | 30720 | 0 |

SYSTEM TAPE D73 GENERATED 12/29/76 AT 16/32 FROM SOURCE TAPE E21

LIST OF ROUTINES MODIFIED

| | BTC STAT | DBC | STC | DTL | TTC | CBD | CBD1 | QBSTAT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $ | $ | $ | $$ | $ | $ | $ 249154 | $ | $ | $ | $$ | $ | $ | $ |
| $ | $ | $ | $$ | $ | $ | $ 249154 | $ | $ | $ | $$ | $ | $ | $ |
| $ | $ | $ | $$ | $ | $ | $ 249154 | $ | $ | $ | $$ | $ | $ | $ |
| $ | $ | $ | $$ | $ | $ | $ 249154 | $ | $ | $ | $$ | $ | $ | $ |
| $ | $ | $ | $$ | $ | $ | $ 249154 | $ | $ | $ | $$ | $ | $ | $ |

APPENDIX C

EXAMPLE OF COLD START JOB SUBMISSION

```
$COPY *SOURCE* TOCENLNZ
*JOB,5066,35631002,SHAW-WM,TD
*LIMIT,T#28,PT#20,PR#350,DD80#1200
*ASSIGN,CNSTF#11,D
*ASSIGN,STRTF#12,D
*ASSIGN,HOUTF#13,D
*ASSIGN,FGSLF#14,D
*TLIB,11,3N,BK#2,MS#1,NS
*TLIB,12,BN,BK#2,MS#1,NS
*TLIB,13,BN,BK#2,MS#1,NS
*TLIB,14,BN,BK#2,MS#1,NS
*ASSIGN,DD80#40
*FORTRAN,S#PLIB,N#TOCNLNZ,FL
*COSY
*RUN,I
   ******1<***** SAMPLE TEST TIME-DEPT. MODEL  ----- NCAR VERS.
  3515.000      0.150  3500.000 0    3.000     DAYEND,DIFDAY,START,LSTART,PRTDAY
  -25      1   400     0.7200  1.00000005-04   MSUN, IBSCAN,MSCAN,ALPHAR,EPSL
   30      5     1                           %DENSITY ADJUST-- MSWP, MCOUNT<, IOFR
11  1    60  1          -1.0000         -3.0000  %1< NTAP,NOTAP,NRT,ITAP,BG,DOUT
85077
12  2    22  1          -1.0000         15.0000  %2< NTAP,NOTAP,NRT,ITAP,BG,DOUT
85410   85322
13  3    22  1          -1.0000          3.0000  %3< NTAP,NOTAP,NRT,ITAP,BG,DOUT
85081   85082   85083
14  2   680  1          -1.0000          1.5000  %4< NTAP,NOTAP,NRT,ITAP,BG,DOUT
85365   85385
  4                                          MSLCT%1<
   1 12    8 14   10  1    11 18
  4                                          MSLCT%2<
```



PRECEDING PAGE BLANK

```
 3 22   11 14   13  1   15 22

 4                                      MSLCT*3<

 4 23    7 14   10  9   14  1

 0.0000   65.0000    0.0000  160.0000                           *LAT1,LAT2,LOG1,LOG2

10.5000   30.0000   60.0000  100.0000  150.0000  225.0000 *Z*K<,K#1,6<

350.0000  700.0000 1500.0000 3000.0000 4000.0000            *Z*K<,K#7,KM<,DEPTH

 5.0000   34.7200    1.0276    0.9580 0.0002750 0.0007500TO,SO,POO,HT,ALPHA,B

 2.5000    0.2000    0.3000    1.5000    0.8000    1.0000 *VISC.-Y,Z-M,S,H<

1EFIJ 1-  -    23   1  22  27   1  26   0   0   2  221/J*MAX,EF1,EF2<,LAN,ING

2INDL 1-  -1  -99 -99 -99 -99 -99 -99 -99 -99 -99   3   2   2   2   9 -99 -99

3INDL 1-  -2  -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99

4INDR 1-  -1    1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0

5INDR 1-  -2    0   0   0   0   0   0   0   0   0   7 -99

6SYBL 1-  -1 *1<     *2<     *3<     *4<     *5<     *6<     *7<     *8<

7SYBL 1-  -2 *9<     *10<    *11<    *12<    *13<    *14<    *15<    *16<

9SYBL 1-  -3 *17<    *18<    *19<    *20<    *21<    *22<    *23*

9IEFJ 1-  -1    3  22   3  22   3  22   4  22   4  22   3  22   3  22   2  22

10IEFJ 1-  -2    2  22   1  22   1  22   1  22   1  22   1  22   6  22   8  22

11IEFJ 1-  -3    9  22   9  22  11  22  12  22  14  22  15  22  17  22  18  22

12IEFJ 1-  -4   18  22  22  22   1   1

13INDX 1- 1-1  -99 -99   3   1   1   1   1   1   1   1   1   1   1   1   1   1

14INDX 1- 1-2    1   1   1   1   1   1  -1

15INDX 1- 2-1  -99 -99   2   0   0   0   0   0   0   0   0   0   0   0   0   0

16INDX 1- 2-2    0   0   0   0   0   0  -1

17INDX 1- 3-1  -99 -99   9   4   0   0   0   0   0   0   0   0   0   0   0   0

18INDX 1- 3-2    0   0   0   0   0   0  -1

19INDX 1- 4-1  -99 -99 -99   2   0   0   0   0   0   0   0   0   0   0   0   0

20INDX 1- 4-2    0   0   0   0   0   0  -1

21INDX 1- 5-1  -99 -99 -99   2   0   0   0   0   0   0   0   0   0   0   0   0

22INDX 1- 5-2    0   0   0   0   0   0  -1
```

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23INDX 1- 6-1 | -99 | -99 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24INDX 1- 6-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 25INDX 1- 7-1 | -99 | -99 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26INDX 1- 7-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 27INDX 1- 8-1 | -99 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28INDX 1- 8-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 29INDX 1- 9-1 | -99 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30INDX 1- 9-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 31INDX 1-10-1 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32INDX 1-10-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 33INDX 1-11-1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 34INDX 1-11-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 35INDX 1-12-1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 36INDX 1-12-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 37INDX 1-13-1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 38INDX 1-13-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 39INDX 1-14-1 | 9 | 7 | 7 | 7 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 40INDX 1-14-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 41INDX 1-15-1 | -99 | -99 | -99 | -99 | -99 | 9 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 42INDX 1-15-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 43INDX 1-16-1 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | 9 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 44INDX 1-16-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 45INDX 1-17-1 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 46INDX 1-17-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 47INDX 1-18-1 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | 9 | 7 | 4 | 0 | 0 | 0 | 0 | 0 |
| 48INDX 1-18-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 49INDX 1-19-1 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | 9 | 4 | 0 | 0 | 0 | 0 |
| 50INDX 1-19-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |
| 51INDX 1-20-1 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | 9 | 7 | 4 | 0 | 0 |
| 52INDX 1-20-2 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | | | | | | | | | |

```
53INDX 1-21-1  -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99   9   4   0
54INDX 1-21-2    0   0   0   0   0   0  -1
55INDX 1-22-1  -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99   9   7
56INDX 1-22-2    4   0   0   0   0   0  -1
57INDX 1-23-1  -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
58INDX 1-23-2    9   4   0   0   0   0  -1
59INDX 1-24-1  -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
60INDX 1-24-2  -99   2   0   0   0   0  -1
61INDX 1-25-1  -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
62INDX 1-25-2  -99   9   7   7   7   4  -1
63INDX 1-26-1  -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
64INDX 1-26-2  -99 -99 -99 -99 -99   9  -1
65INDX 1-27-1  -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
66INDX 1-27-2  -99 -99 -99 -99 -99 -99 -99
67EPIJ 1- 1-1   -0.000  -0.000 -17.652 -17.362 -17.393 -17.793 -18.443 -19.058
68EPIJ 1- 1-2  -19.363 -19.094 -18.241 -17.078 -15.891 -14.966 -14.462 -14.246
69EPIJ 1- 1-3  -14.152 -14.009 -13.674 -13.132 -12.406 -11.521 -10.502
70EPIJ 1- 2-1   -0.000  -0.000 -18.211 -17.939 -17.765 -17.715 -17.722 -17.668
71EPIJ 1- 2-2  -17.438 -16.920 -16.122 -15.183 -14.249 -13.465 -12.909 -12.507
72EPIJ 1- 2-3  -12.166 -11.791 -11.299 -10.663  -9.868  -8.902  -7.759
73EPIJ 1- 3-1   -0.000  -0.000 -18.512 -18.245 -17.881 -17.392 -16.789 -16.105
74EPIJ 1- 3-2  -15.372 -14.622 -13.879 -13.153 -12.459 -11.807 -11.200 -10.619
75EPIJ 1- 3-3  -10.041  -9.443  -8.800  -8.071  -7.211  -6.173  -4.922
76EPIJ 1- 4-1   -0.000  -0.000  -0.000 -18.012 -17.463 -16.578 -15.435 -14.198
77EPIJ 1- 4-2  -13.026 -12.077 -11.387 -10.854 -10.373  -9.837  -9.181  -8.435
78EPIJ 1- 4-3   -7.639  -6.835  -6.050  -5.234  -4.316  -3.224  -1.896
79EPIJ 1- 5-1   -0.000  -0.000  -0.000 -16.969 -16.244 -15.026 -13.449 -11.772
80EPIJ 1- 5-2  -10.258  -9.161  -8.522  -8.151  -7.843  -7.397  -6.695  -5.805
81EPIJ 1- 5-3   -4.821  -3.838  -2.924  -2.029  -1.065    .056   1.413
82EPIJ 1- 6-1   -0.000  -0.000 -15.280 -14.846 -13.957 -12.493 -10.618  -8.656
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 83EPIJ 1- 6-2 | -6.929 | -5.750 | -5.161 | -4.908 | -4.721 | -4.333 | -3.587 | -2.582 |
| 84EPIJ 1- 6-3 | -1.449 | -.320 | .702 | 1.665 | 2.660 | 3.777 | 5.099 | |
| 85EPIJ 1- 7-1 | -0.000 | -0.000 | -12.030 | -11.446 | -10.408 | -8.800 | -6.796 | -4.732 |
| 86EPIJ 1- 7-2 | -2.947 | -1.765 | -1.223 | -1.037 | -.907 | -.535 | .249 | 1.333 |
| 87EPIJ 1- 7-3 | 2.567 | 3.797 | 4.905 | 5.922 | 6.927 | 7.999 | 9.209 | |
| 88EPIJ 1- 8-1 | -0.000 | -9.390 | -7.869 | -7.098 | -5.934 | -4.278 | -2.294 | -.290 |
| 89EPIJ 1- 8-2 | 1.421 | 2.541 | 3.046 | 3.217 | 3.349 | 3.737 | 4.549 | 5.670 |
| 90EPIJ 1- 8-3 | 6.947 | 8.226 | 9.383 | 10.429 | 11.417 | 12.402 | 13.432 | |
| 91EPIJ 1- 9-1 | -0.000 | -4.101 | -3.333 | -2.370 | -1.112 | .514 | 2.369 | 4.199 |
| 92EPIJ 1- 9-2 | 5.748 | 6.769 | 7.255 | 7.456 | 7.638 | 8.064 | 8.883 | 9.991 |
| 93EPIJ 1- 9-3 | 11.249 | 12.514 | 13.670 | 14.706 | 15.642 | 16.499 | 17.299 | |
| 94EPIJ 1-10-1 | -.924 | .027 | 1.039 | 2.170 | 3.482 | 5.016 | 6.671 | 8.261 |
| 95EPIJ 1-10-2 | 9.603 | 10.518 | 11.011 | 11.284 | 11.551 | 12.023 | 12.822 | 13.860 |
| 96EPIJ 1-10-3 | 15.026 | 16.205 | 17.239 | 18.271 | 19.111 | 19.803 | 20.340 | |
| 97EPIJ 1-11-1 | 2.340 | 3.512 | 4.709 | 5.953 | 7.269 | 8.670 | 10.092 | 11.425 |
| 98EPIJ 1-11-2 | 12.558 | 13.386 | 13.921 | 14.303 | 14.678 | 15.194 | 15.934 | 16.840 |
| 99EPIJ 1-11-3 | 17.837 | 18.847 | 19.799 | 20.643 | 21.333 | 21.825 | 22.084 | |
| 100EPIJ 1-12-1 | 4.602 | 5.887 | 7.169 | 8.443 | 9.705 | 10.949 | 12.144 | 13.246 |
| 101EPIJ 1-12-2 | 14.211 | 14.997 | 15.616 | 16.137 | 16.634 | 17.178 | 17.814 | 19.518 |
| 102EPIJ 1-12-3 | 19.262 | 20.012 | 20.735 | 21.369 | 21.850 | 22.111 | 22.095 | |
| 103EPIJ 1-13-1 | 5.815 | 7.099 | 8.362 | 9.583 | 10.740 | 11.814 | 12.803 | 13.717 |
| 104EPIJ 1-13-2 | 14.563 | 15.349 | 16.080 | 16.751 | 17.362 | 17.909 | 18.396 | 18.840 |
| 105EPIJ 1-13-3 | 19.262 | 19.681 | 20.104 | 20.469 | 20.699 | 20.712 | 20.441 | |
| 106EPIJ 1-14-1 | 6.215 | 7.412 | 8.578 | 9.684 | 10.700 | 11.600 | 12.406 | 13.165 |
| 107EPIJ 1-14-2 | 13.923 | 14.727 | 15.565 | 16.368 | 17.064 | 17.578 | 17.880 | 18.029 |
| 108EPIJ 1-14-3 | 18.095 | 18.150 | 18.244 | 18.321 | 18.292 | 18.071 | 17.581 | |
| 109EPIJ 1-15-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | 10.653 | 11.297 | 11.926 |
| 110EPIJ 1-15-2 | 12.611 | 13.422 | 14.333 | 15.218 | 15.946 | 16.384 | 16.474 | 16.313 |
| 111EPIJ 1-15-3 | 16.022 | 15.721 | 15.501 | 15.311 | 15.056 | 14.640 | 13.982 | |
| 112EPIJ 1-16-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | 10.336 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 113EPIJ | 1-16-2 | 10.944 | 11.727 | 12.644 | 13.531 | 14.215 | 14.525 | 14.382 | 13.922 |
| 114EPIJ | 1-16-3 | 13.306 | 12.697 | 12.221 | 11.827 | 11.412 | 10.871 | 10.112 | |
| 115EPIJ | 1-17-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 116EPIJ | 1-17-2 | 9.238 | 9.930 | 10.757 | 11.536 | 12.079 | 12.198 | 11.913 | 11.086 |
| 117EPIJ | 1-17-3 | 10.210 | 9.379 | 8.746 | 8.254 | 7.782 | 7.211 | 6.433 | |
| 118EPIJ | 1-18-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 119EPIJ | 1-18-2 | 7.667 | 8.204 | 8.841 | 9.404 | 9.714 | 9.589 | 8.964 | 8.016 |
| 120EPIJ | 1-18-3 | 6.961 | 6.012 | 5.334 | 4.858 | 4.439 | 3.937 | 3.221 | |
| 121EPIJ | 1-19-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 122EPIJ | 1-19-2 | -0.000 | -0.000 | 6.954 | 7.235 | 7.258 | 6.869 | 6.021 | 4.905 |
| 123EPIJ | 1-19-3 | 3.745 | 2.762 | 2.126 | 1.749 | 1.463 | 1.100 | .508 | |
| 124EPIJ | 1-20-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 125EPIJ | 1-20-2 | -0.000 | -0.000 | -0.000 | 5.122 | 4.847 | 4.204 | 3.171 | 1.943 |
| 126EPIJ | 1-20-3 | .742 | -.203 | -.744 | -.970 | -1.078 | -1.260 | -1.691 | |
| 127EPIJ | 1-21-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 128EPIJ | 1-21-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | 1.764 | .601 | -.680 |
| 129EPIJ | 1-21-3 | -1.845 | -2.739 | -3.142 | -3.198 | -3.118 | -3.108 | -3.361 | |
| 130EPIJ | 1-22-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 131EPIJ | 1-22-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -1.504 | -2.776 |
| 132EPIJ | 1-22-3 | -3.896 | -4.664 | -4.933 | -4.835 | -4.587 | -4.404 | -4.487 | |
| 133EPIJ | 1-23-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 134EPIJ | 1-23-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 135EPIJ | 1-23-3 | -5.260 | -5.903 | -6.060 | -5.844 | -5.472 | -5.154 | -5.087 | |
| 136EPIJ | 1-24-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 137EPIJ | 1-24-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 138EPIJ | 1-24-3 | -0.000 | -6.590 | -6.638 | -6.335 | -5.876 | -5.457 | -5.260 | |
| 139EPIJ | 1-25-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 140EPIJ | 1-25-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 141EPIJ | 1-25-3 | -0.000 | -6.948 | -6.804 | -6.438 | -5.921 | -5.425 | -5.111 | |
| 142EPIJ | 1-26-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |

```
143EPIJ 1-26-2   -0.000  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000
144EPIJ 1-26-3   -0.000  -0.000  -0.000  -0.000  -0.000  -5.169  -4.747
145EPIJ 1-27-1   -0.000  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000
146EPIJ 1-27-2   -0.000  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000
147EPIJ 1-27-3   -0.000  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000
148EFIJ 2-   -    23   2  22  27   1  27   1   2   4  221/J%MAX.EF1.EF2<.LAN.ING
149INDL 2-   -1    1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
150INDL 2-   -2    0   0   0   0   0   0   0   0   4   9 -99
151INDR 2-   -1    1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
152INDR 2-   -2    0   0   0   0   0   0   0   7 -99 -99 -99
153SYBL 2-   -1 *22*    %23<    %24<    %25<    %26<    %27<    %28<    %29<
154SYBL 2-   -2 %30<    %31<    %32<    %33<    %34<    %35<    %36<    %37<
155SYBL 2-   -3 %38<    %39<    %40<    %41<    %42<    %43<    *44*
156IEFJ 2-   -1    2  22   2  22   2  22   2  22   2  22   2  22   2  22   2  22
157IEFJ 2-   -2    2  22   2  22   2  22   2  22   2  22   2  22   2  22   2  22
158IEFJ 2-   -3    2  22   2  22   2  22   2  22   2  22   2  22   2  22   2  22
159IEFJ 2-   -4    2  22   2  10   4  10
160INDX 2- 1-1   -2   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1
161INDX 2- 1-2    1   1   1   1   1   1  -3
162INDX 2- 2-1   -2   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
163INDX 2- 2-2    0   0   0   0   0   0  -3
164INDX 2- 3-1   -2   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
165INDX 2- 3-2    0   0   0   0   0   0  -3
166INDX 2- 4-1   -2   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
167INDX 2- 4-2    0   0   0   0   0   0  -3
168INDX 2- 5-1   -2   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
169INDX 2- 5-2    0   0   0   0   0   0  -3
170INDX 2- 6-1   -2   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
171INDX 2- 6-2    0   0   0   0   0   0  -3
172INDX 2- 7-1   -2   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
```

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 173INDX 2- 7-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 174INDX 2- 8-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 175INDX 2- 8-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 176INDX 2- 9-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177INDX 2- 9-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 178INDX 2-10-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 179INDX 2-10-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 180INDX 2-11-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 181INDX 2-11-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 182INDX 2-12-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 183INDX 2-12-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 184INDX 2-13-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 185INDX 2-13-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 186INDX 2-14-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 187INDX 2-14-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 188INDX 2-15-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 189INDX 2-15-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 190INDX 2-16-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 191INDX 2-16-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 192INDX 2-17-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193INDX 2-17-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 194INDX 2-18-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 195INDX 2-18-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 196INDX 2-19-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 197INDX 2-19-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 198INDX 2-20-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 199INDX 2-20-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 200INDX 2-21-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201INDX 2-21-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 202INDX 2-22-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 203INDX | 2-22-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 204INDX | 2-23-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 205INDX | 2-23-2 | 0 | 0 | 0 | 0 | 0 | 0 | -3 | | | | | | | | | |
| 206INDX | 2-24-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 207INDX | 2-24-2 | 0 | 0 | 0 | 0 | 0 | 12 | -3 | | | | | | | | | |
| 208INDX | 2-25-1 | -2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 7 | 7 | 7 | 7 | 7 | 7 |
| 209INDX | 2-25-2 | 7 | 7 | 7 | 7 | 7 | 11 | -99 | | | | | | | | | |
| 210INDX | 2-26-1 | -2 | 7 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 8 | -99 | -99 | -99 | -99 | -99 | -99 |
| 211INDX | 2-26-2 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | | | | | | | | | |
| 212INDX | 2-27-1 | -99 | -99 | -99 | 9 | 7 | 7 | 7 | 7 | 7 | 11 | -99 | -99 | -99 | -99 | -99 | -99 |
| 213INDX | 2-27-2 | -99 | -99 | -99 | -99 | -99 | -99 | -99 | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 214EPIJ | 2- 1-1 | -11.521 | -10.502 | -9.418 | -8.365 | -7.438 | -6.730 | -6.288 | -6.090 |
| 215EPIJ | 2- 1-2 | -6.114 | -6.336 | -6.684 | -6.968 | -6.972 | -6.483 | -5.356 | -3.849 |
| 216EPIJ | 2- 1-3 | -2.372 | -1.334 | -1.119 | -1.743 | -2.934 | -4.415 | -5.909 | |
| 217EPIJ | 2- 2-1 | -8.902 | -7.759 | -6.502 | -5.239 | -4.079 | -3.130 | -2.450 | -2.030 |
| 218EPIJ | 2- 2-2 | -1.859 | -1.924 | -2.162 | -2.376 | -2.343 | -1.844 | -.726 | .752 |
| 219EPIJ | 2- 2-3 | 2.177 | 3.136 | 3.242 | 2.491 | 1.176 | -.404 | -1.952 | |
| 220EPIJ | 2- 3-1 | -6.173 | -4.922 | -3.513 | -2.067 | -.701 | .466 | 1.366 | 1.995 |
| 221EPIJ | 2- 3-2 | 2.356 | 2.449 | 2.330 | 2.199 | 2.281 | 2.800 | 3.911 | 5.356 |
| 222EPIJ | 2- 3-3 | 6.725 | 7.606 | 7.613 | 6.752 | 5.333 | 3.670 | 2.077 | |
| 223EPIJ | 2- 4-1 | -3.224 | -1.896 | -.382 | 1.197 | 2.716 | 4.053 | 5.135 | 5.949 |
| 224EPIJ | 2- 4-2 | 6.488 | 6.743 | 6.762 | 6.740 | 6.897 | 7.452 | 8.560 | 9.967 |
| 225EPIJ | 2- 4-3 | 11.274 | 12.077 | 12.003 | 11.066 | 9.580 | 7.869 | 6.253 | |
| 226EPIJ | 2- 5-1 | .056 | 1.413 | 2.965 | 4.596 | 6.189 | 7.627 | 8.836 | 9.798 |
| 227EPIJ | 2- 5-2 | 10.497 | 10.920 | 11.105 | 11.230 | 11.500 | 12.119 | 13.228 | 14.588 |
| 228EPIJ | 2- 5-3 | 15.822 | 16.551 | 16.423 | 15.458 | 13.964 | 12.257 | 10.648 | |
| 229EPIJ | 2- 6-1 | 3.777 | 5.093 | 6.599 | 8.178 | 9.738 | 11.182 | 12.445 | 13.504 |
| 230EPIJ | 2- 6-2 | 14.342 | 14.941 | 15.327 | 15.652 | 16.087 | 16.804 | 17.920 | 19.221 |
| 231EPIJ | 2- 6-3 | 20.370 | 21.028 | 20.883 | 19.957 | 18.531 | 16.896 | 15.337 | |
| 232EPIJ | 2- 7-1 | 7.999 | 9.209 | 10.547 | 11.949 | 13.351 | 14.688 | 15.915 | 17.013 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 233EPIJ | 2- 7-2 | 17.961 | 18.743 | 19.373 | 19.957 | 20.616 | 21.472 | 22.604 | 23.831 |
| 234EPIJ | 2- 7-3 | 24.878 | 25.470 | 25.351 | 24.541 | 23.274 | 21.792 | 20.332 | |
| 235EPIJ | 2- 8-1 | 12.402 | 13.432 | 14.517 | 15.638 | 16.775 | 17.912 | 19.029 | 20.110 |
| 236EPIJ | 2- 8-2 | 21.138 | 22.097 | 22.938 | 23.863 | 24.779 | 25.795 | 26.943 | 28.085 |
| 237EPIJ | 2- 8-3 | 29.021 | 29.550 | 29.446 | 28.846 | 27.802 | 26.529 | 25.203 | |
| 238EPIJ | 2- 9-1 | 16.499 | 17.279 | 18.070 | 18.844 | 19.653 | 20.531 | 21.488 | 22.512 |
| 239EPIJ | 2- 9-2 | 23.587 | 24.698 | 25.832 | 26.982 | 28.144 | 29.312 | 30.470 | 31.521 |
| 240EPIJ | 2- 9-3 | 32.342 | 32.811 | 32.812 | 32.356 | 31.550 | 30.502 | 29.322 | |
| 241EPIJ | 2-10-1 | 19.803 | 20.340 | 20.769 | 21.169 | 21.626 | 22.222 | 22.997 | 23.936 |
| 242EPIJ | 2-10-2 | 25.023 | 26.240 | 27.560 | 28.927 | 30.281 | 31.563 | 32.713 | 33.673 |
| 243EPIJ | 2-10-3 | 34.386 | 34.796 | 34.950 | 34.552 | 33.954 | 33.105 | 32.058 | |
| 244EPIJ | 2-11-1 | 21.925 | 22.084 | 22.172 | 22.213 | 22.335 | 22.662 | 23.257 | 24.098 |
| 245EPIJ | 2-11-2 | 25.161 | 26.419 | 27.832 | 29.310 | 30.760 | 32.086 | 33.203 | 34.078 |
| 246EPIJ | 2-11-3 | 34.697 | 35.049 | 35.121 | 34.916 | 34.448 | 33.733 | 32.782 | |
| 247EPIJ | 2-12-1 | 22.111 | 22.095 | 21.876 | 21.609 | 21.451 | 21.556 | 21.997 | 22.739 |
| 248EPIJ | 2-12-2 | 23.739 | 24.956 | 26.333 | 27.776 | 29.185 | 30.460 | 31.509 | 32.308 |
| 249EPIJ | 2-12-3 | 32.855 | 33.148 | 33.184 | 32.970 | 32.514 | 31.825 | 30.914 | |
| 250EPIJ | 2-13-1 | 20.712 | 20.441 | 19.965 | 19.455 | 19.083 | 19.021 | 19.340 | 19.982 |
| 251EPIJ | 2-13-2 | 20.884 | 21.978 | 23.196 | 24.463 | 25.699 | 26.826 | 27.773 | 28.503 |
| 252EPIJ | 2-13-3 | 28.994 | 29.224 | 29.172 | 28.848 | 28.290 | 27.532 | 26.612 | |
| 253EPIJ | 2-14-1 | 18.071 | 17.591 | 16.901 | 16.208 | 15.679 | 15.490 | 15.706 | 16.243 |
| 254EPIJ | 2-14-2 | 17.012 | 17.922 | 18.894 | 19.884 | 20.855 | 21.766 | 22.579 | 23.235 |
| 255EPIJ | 2-14-3 | 23.673 | 23.831 | 23.652 | 23.157 | 22.428 | 21.549 | 20.600 | |
| 256EPIJ | 2-15-1 | 14.640 | 13.982 | 13.156 | 12.335 | 11.694 | 11.407 | 11.525 | 11.945 |
| 257EPIJ | 2-15-2 | 12.553 | 13.236 | 13.902 | 14.567 | 15.218 | 15.871 | 16.521 | 17.087 |
| 258EPIJ | 2-15-3 | 17.461 | 17.535 | 17.208 | 16.514 | 15.592 | 14.581 | 13.619 | |
| 259EPIJ | 2-16-1 | 10.871 | 10.112 | 9.200 | 8.302 | 7.585 | 7.213 | 7.228 | 7.510 |
| 260EPIJ | 2-16-2 | 7.932 | 8.365 | 8.722 | 9.035 | 9.355 | 9.732 | 10.195 | 10.644 |
| 261EPIJ | 2-16-3 | 10.929 | 10.879 | 10.419 | 9.537 | 8.445 | 7.339 | 6.410 | |
| 262EPIJ | 2-17-1 | 7.211 | 6.433 | 5.501 | 4.572 | 3.802 | 3.346 | 3.239 | 3.359 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 263EPIJ | 2-17-2 | 3.573 | 3.751 | 3.812 | 3.810 | 3.825 | 3.935 | 4.192 | 4.483 |
| 264EPIJ | 2-17-3 | 4.638 | 4.483 | 3.862 | 2.838 | 1.645 | .521 | -.296 | |
| 265EPIJ | 2-18-1 | 3.937 | 3.221 | 2.331 | 1.411 | .609 | .069 | -.177 | -.241 |
| 266EPIJ | 2-18-2 | -.245 | -.311 | -.511 | -.778 | -1.024 | -1.160 | -1.125 | -1.029 |
| 267EPIJ | 2-18-3 | -1.045 | -1.347 | -2.093 | -3.204 | -4.419 | -5.472 | -6.102 | |
| 268EPIJ | 2-19-1 | 1.100 | .508 | -.292 | -1.165 | -1.974 | -2.586 | -2.967 | -3.214 |
| 269EPIJ | 2-19-2 | -3.431 | -3.724 | -4.151 | -4.645 | -5.118 | -5.483 | -5.677 | -5.802 |
| 270EPIJ | 2-19-3 | -6.017 | -6.483 | -7.344 | -8.507 | -9.698 | -10.635 | -11.042 | |
| 271EPIJ | 2-20-1 | -1.260 | -1.691 | -2.365 | -3.158 | -3.944 | -4.602 | -5.094 | -5.500 |
| 272EPIJ | 2-20-2 | -5.907 | -6.401 | -7.028 | -7.722 | -8.402 | -8.984 | -9.409 | -9.765 |
| 273EPIJ | 2-20-3 | -10.192 | -10.831 | -11.806 | -13.012 | -14.168 | -14.986 | -15.182 | |
| 274EPIJ | 2-21-1 | -3.108 | -3.361 | -3.886 | -4.559 | -5.298 | -5.959 | -6.518 | -7.039 |
| 275EPIJ | 2-21-2 | -7.595 | -8.258 | -9.061 | -9.942 | -10.819 | -11.613 | -12.265 | -12.848 |
| 276EPIJ | 2-21-3 | -13.484 | -14.297 | -15.393 | -16.659 | -17.806 | -18.544 | -18.585 | |
| 277EPIJ | 2-22-1 | -4.404 | -4.487 | -4.853 | -5.402 | -6.031 | -6.641 | -7.200 | -7.770 |
| 278EPIJ | 2-22-2 | -8.417 | -9.207 | -10.171 | -11.236 | -12.316 | -13.321 | -14.187 | -14.977 |
| 279EPIJ | 2-22-3 | -15.807 | -16.789 | -18.023 | -19.387 | -20.587 | -21.329 | -21.318 | |
| 280EPIJ | 2-23-1 | -5.154 | -5.087 | -5.294 | -5.687 | -6.176 | -6.672 | -7.156 | -7.696 |
| 281EPIJ | 2-23-2 | -8.367 | -9.243 | -10.354 | -11.611 | -12.904 | -14.125 | -15.188 | -16.159 |
| 282EPIJ | 2-23-3 | -17.156 | -18.298 | -19.690 | -21.206 | -22.544 | -23.396 | -23.460 | |
| 283EPIJ | 2-24-1 | -5.457 | -5.260 | -5.308 | -5.528 | -5.842 | -6.173 | -6.518 | -6.963 |
| 284EPIJ | 2-24-2 | -7.602 | -8.528 | -9.776 | -11.231 | -12.749 | -14.189 | -15.437 | -16.564 |
| 285EPIJ | 2-24-3 | -17.706 | -19.000 | -20.567 | -22.282 | -23.826 | -24.880 | -25.125 | |
| 286EPIJ | 2-25-1 | -5.425 | -5.111 | -5.002 | -5.036 | -5.148 | -5.276 | -5.434 | -5.736 |
| 287EPIJ | 2-25-2 | -6.301 | -7.250 | -8.629 | -10.286 | -12.038 | -13.698 | -15.121 | -16.386 |
| 288EPIJ | 2-25-3 | -17.657 | -19.097 | -20.853 | -22.800 | -24.604 | -25.927 | -0.000 | |
| 289EPIJ | 2-26-1 | -5.169 | -4.747 | -4.481 | -4.321 | -4.214 | -4.113 | -4.053 | -4.178 |
| 290EPIJ | 2-26-2 | -4.642 | -5.596 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 291EPIJ | 2-26-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 292EPIJ | 2-27-1 | -0.000 | -0.000 | -0.000 | -3.495 | -3.161 | -2.818 | -2.524 | -2.457 |

```
293EPIJ 2-27-2   -2.805  -3.756  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000
294EPIJ 2-27-3   -0.000  -0.000  -0.000  -0.000  -0.000  -0.000  -0.000
295EFIJ 3-  -      23   2  23  27   1  24   3   2   0   OI/J%MAX,EF1,EF2<,LAN,ING
296INDL 3-  -1      1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
297INDL 3-  -2      0   0   0   0   0   0   0  12  11 -99 -99
298INDR 3-  -1     10   8   8  11 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
299INDR 3-  -2    -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
300SYBL 3-  -1 *43*    %44<    %45<    %46<    %47<    %48<    %49<    %50<
301SYBL 3-  -2 %51<    %52<    %53<    %54<    %55<    %56<    %57<    %58<
302SYBL 3-  -3 %59<    %60<    %61<    %62<    %63<    %64<    %65<
303IFFJ 3-  -1      2  23   2  23   2  23   2  23   2  22   2  20   2  20   2  18
304IFFJ 3-  -2      2  14   2  13   2  11   2  10   2   9   2   8   2   8   2   7
305IFFJ 3-  -3      2   6   2   5   2   5   2   5   2   5   2   5   2   4   2   3
306IFFJ 3-  -4      1   1   1   1   1   1
307INDX 3- 1-1     -4   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1
308INDX 3- 1-2      1   1   1   1   1   1  10
309INDX 3- 2-1     -4   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
310INDX 3- 2-2      0   0   0   0   0   0   8
311INDX 3- 3-1     -4   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
312INDX 3- 3-2      0   0   0   0   0   0   8
313INDX 3- 4-1     -4   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
314INDX 3- 4-2      0   0   3   0   0  12  11
315INDX 3- 5-1     -4   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
316INDX 3- 5-2      0   0   0  12   7  11 -99
317INDX 3- 6-1     -4   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
318INDX 3- 6-2      0   0   0   8 -99 -99 -99
319INDX 3- 7-1     -4   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
320INDX 3- 7-2      0  12   7  11 -99 -99 -99
321INDX 3- 8-1     -4   0   0   0   0   0   0   0   0   0   0   0   0  12   7   7
322INDX 3- 8-2      7  11 -99 -99 -99 -99 -99
```

```
323INDX 3- 9-1   -4    0    0    0    0    0    0    0    0    0    0    0   12   11  -99  -99
324INDX 3- 9-2  -99  -99  -99  -99  -99  -99  -99
325INDX 3-10-1   -4    0    0    0    0    0    0    0    0    0   12    7   11  -99  -99  -99
326INDX 3-10-2  -99  -99  -99  -99  -99  -99  -99
327INDX 3-11-1   -4    0    0    0    0    0    0    0    0   12   11  -99  -99  -99  -99  -99
328INDX 3-11-2  -99  -99  -99  -99  -99  -99  -99
329INDX 3-12-1   -4    0    0    0    0    0    0    0   12   11  -99  -99  -99  -99  -99  -99
330INDX 3-12-2  -99  -99  -99  -99  -99  -99  -99
331INDX 3-13-1   -4    0    0    0    0    0    0   12   11  -99  -99  -99  -99  -99  -99  -99
332INDX 3-13-2  -99  -99  -99  -99  -99  -99  -99
333INDX 3-14-1   -4    0    0    0    0    0    0    8  -99  -99  -99  -99  -99  -99  -99  -99
334INDX 3-14-2  -99  -99  -99  -99  -99  -99  -99
335INDX 3-15-1   -4    0    0    0    0    0   12   11  -99  -99  -99  -99  -99  -99  -99  -99
336INDX 3-15-2  -99  -99  -99  -99  -99  -99  -99
337INDX 3-16-1   -4    0    0    0    0   12   11  -99  -99  -99  -99  -99  -99  -99  -99  -99
338INDX 3-16-2  -99  -99  -99  -99  -99  -99  -99
339INDX 3-17-1   -4    0    0    0   12   11  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99
340INDX 3-17-2  -99  -99  -99  -99  -99  -99  -99
341INDX 3-18-1   -4    0    0    0    8  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99
342INDX 3-18-2  -99  -99  -99  -99  -99  -99  -99
343INDX 3-19-1   -4    0    0    0    8  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99
344INDX 3-19-2  -99  -99  -99  -99  -99  -99  -99
345INDX 3-20-1   -4    0    0    0    8  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99
346INDX 3-20-2  -99  -99  -99  -99  -99  -99  -99
347INDX 3-21-1   -4    0    0    0    8  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99
348INDX 3-21-2  -99  -99  -99  -99  -99  -99  -99
349INDX 3-22-1   -4    0    0   12   11  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99
350INDX 3-22-2  -99  -99  -99  -99  -99  -99  -99
351INDX 3-23-1   -4    0   12   11  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99  -99
352INDX 3-23-2  -99  -99  -99  -99  -99  -99  -99
```

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353INDX 3-24-1    -4   7  11 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
354INDX 3-24-2   -99 -99 -99 -99 -99 -99 -99
355INDX 3-25-1    -4 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
356INDX 3-25-2   -99 -99 -99 -99 -99 -99 -99
357INDX 3-26-1   -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
358INDX 3-26-2   -99 -99 -99 -99 -99 -99 -99
359INDX 3-27-1   -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99 -99
360INDX 3-27-2   -99 -99 -99 -99 -99 -99 -99
361EPIJ 3- 1-1    -4.415  -5.909  -7.230  -8.335  -9.193  -9.772 -10.066 -10.157
362EPIJ 3- 1-2   -10.145 -10.130 -10.199 -10.359 -10.579 -10.826 -11.070 -11.305
363EPIJ 3- 1-3   -11.543 -11.801 -12.091 -12.422 -12.783 -13.165 -13.557
364EPIJ 3- 2-1     -.404  -1.952  -3.278  -4.357  -5.177  -5.730  -6.030  -6.180
365EPIJ 3- 2-2    -6.301  -6.514  -6.923  -7.514  -8.221  -8.977  -9.717 -10.414
366EPIJ 3- 2-3   -11.079 -11.721 -12.350 -12.975 -13.596 -14.215 -14.833
367EPIJ 3- 3-1     3.670   2.077    .748   -.311  -1.108  -1.654  -1.984  -2.217
368EPIJ 3- 3-2    -2.492  -2.946  -3.697  -4.712  -5.893  -7.141  -8.358  -9.501
369EPIJ 3- 3-3   -10.575 -11.585 -12.537 -13.441 -14.307 -15.148 -15.977
370EPIJ 3- 4-1     7.869   6.253   4.923   3.870   3.067   2.498   2.081   1.717
371EPIJ 3- 4-2     1.247    .525   -.573  -1.999  -3.627  -5.331  -6.990  -8.543
372EPIJ 3- 4-3    -9.991 -11.336 -12.590 -13.731 -14.812 -15.846 -16.857
373EPIJ 3- 5-1    12.257  10.648   9.321   8.253   7.402   6.731   6.176   5.608
374EPIJ 3- 5-2     4.891   3.851   2.397    .592  -1.452  -3.562  -5.606  -7.517
375EPIJ 3- 5-3    -9.289 -10.919 -12.406 -13.759 -15.010 -16.192  -0.000
376EPIJ 3- 6-1    16.896  15.337  14.017  12.904  11.950  11.107  10.309   9.441
377EPIJ 3- 6-2     8.375   6.984   5.164   2.987    .601  -1.845  -4.203  -6.401
378EPIJ 3- 6-3    -8.428 -10.277 -11.944 -13.437  -0.000  -0.000  -0.000
379EPIJ 3- 7-1    21.792  20.332  19.025  17.835  16.712  15.605  14.454  13.175
380EPIJ 3- 7-2    11.676   9.864   7.669   5.166   2.495   -.201  -2.784  -5.182
381EPIJ 3- 7-3    -7.382  -9.371 -11.140 -12.678  -0.000  -0.000  -0.000
382EPIJ 3- 8-1    26.529  25.203  23.916  22.631  21.300  19.877  18.314  16.568
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 383EPIJ | 3- 8-2 | 14.594 | 12.348 | 9.802 | 7.029 | 4.154 | 1.297 | -1.421 | -3.933 |
| 384EPIJ | 3- 8-3 | -6.224 | -8.278 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 385EPIJ | 3- 9-1 | 30.502 | 29.322 | 28.061 | 26.685 | 25.155 | 23.427 | 21.471 | 19.286 |
| 386EPIJ | 3- 9-2 | 16.978 | 14.254 | 11.427 | 8.470 | 5.479 | 2.553 | -0.000 | -0.000 |
| 387EPIJ | 3- 9-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 388EPIJ | 3-10-1 | 33.105 | 32.058 | 30.831 | 29.394 | 27.714 | 25.756 | 23.505 | 20.996 |
| 389EPIJ | 3-10-2 | 18.278 | 15.400 | 12.412 | 9.380 | 6.375 | -0.000 | -0.000 | -0.000 |
| 390EPIJ | 3-10-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 391EPIJ | 3-11-1 | 33.733 | 32.782 | 31.596 | 30.150 | 28.416 | 26.367 | 23.997 | 21.365 |
| 392EPIJ | 3-11-2 | 18.543 | 15.605 | 12.622 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 393EPIJ | 3-11-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 394EPIJ | 3-12-1 | 31.825 | 30.914 | 29.779 | 28.396 | 26.745 | 24.803 | 22.564 | 20.088 |
| 395EPIJ | 3-12-2 | 17.445 | 14.704 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 396EPIJ | 3-12-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 397EPIJ | 3-13-1 | 27.532 | 26.612 | 25.542 | 24.303 | 22.872 | 21.227 | 19.359 | 17.300 |
| 398EPIJ | 3-13-2 | 15.095 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 399EPIJ | 3-13-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 400EPIJ | 3-14-1 | 21.548 | 20.600 | 19.625 | 18.599 | 17.495 | 16.283 | 14.943 | 13.470 |
| 401EPIJ | 3-14-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 402EPIJ | 3-14-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 403EPIJ | 3-15-1 | 14.581 | 13.619 | 12.779 | 12.027 | 11.323 | 10.624 | 9.890 | 9.078 |
| 404EPIJ | 3-15-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 405EPIJ | 3-15-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 406EPIJ | 3-16-1 | 7.339 | 6.410 | 5.758 | 5.332 | 5.069 | 4.905 | 4.774 | -0.000 |
| 407EPIJ | 3-16-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 408EPIJ | 3-16-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 409EPIJ | 3-17-1 | .521 | -.296 | -.695 | -.753 | -.566 | -.229 | -0.000 | -0.000 |
| 410EPIJ | 3-17-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 411EPIJ | 3-17-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 412EPIJ | 3-18-1 | -5.472 | -6.102 | -6.192 | -5.861 | -5.243 | -0.000 | -0.000 | -0.000 |

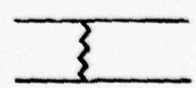
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 413EPIJ | 3-18-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 414EPIJ | 3-18-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 415EPIJ | 3-19-1 | -10.635 | -11.042 | -10.812 | -10.104 | -9.097 | -0.000 | -0.000 | -0.000 |
| 416EPIJ | 3-19-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 417EPIJ | 3-19-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 418EPIJ | 3-20-1 | -14.986 | -15.182 | -14.661 | -13.624 | -12.294 | -0.000 | -0.000 | -0.000 |
| 419EPIJ | 3-20-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 420EPIJ | 3-20-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 421EPIJ | 3-21-1 | -18.544 | -18.585 | -17.847 | -16.564 | -14.998 | -0.000 | -0.000 | -0.000 |
| 422EPIJ | 3-21-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 423EPIJ | 3-21-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 424EPIJ | 3-22-1 | -21.329 | -21.318 | -20.479 | -19.069 | -17.377 | -0.000 | -0.000 | -0.000 |
| 425EPIJ | 3-22-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 426EPIJ | 3-22-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 427EPIJ | 3-23-1 | -23.396 | -23.460 | -22.657 | -21.257 | -0.000 | -0.000 | -0.000 | -0.000 |
| 428EPIJ | 3-23-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 429EPIJ | 3-23-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 430EPIJ | 3-24-1 | -24.980 | -25.125 | -24.475 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 431EPIJ | 3-24-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 432EPIJ | 3-24-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 433EPIJ | 3-25-1 | -25.927 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 434EPIJ | 3-25-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 435EPIJ | 3-25-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 436EPIJ | 3-26-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 437EPIJ | 3-26-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 438EPIJ | 3-26-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |
| 439EPIJ | 3-27-1 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 440EPIJ | 3-27-2 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 |
| 441EPIJ | 3-27-3 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | -0.000 | |

1 1 854.0 28.0 -35.0 1.0 12.0 | .175 .011 0.000 0.000 -.004

$\longleftarrow Q_0 \longrightarrow$ | $\longleftarrow CC \longrightarrow$

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 2 | 850.0 | 4.0 | -35.0 | 5.0 | 12.0 | .280 | -.010 | .005 | -.006 | .001 |
| 3 | 3 | 847.0 | -20.0 | -35.0 | 9.0 | 12.0 | .384 | -.030 | .011 | -.013 | .006 |
| 4 | 4 | 844.0 | -44.0 | -35.0 | 13.0 | 12.0 | .324 | -.046 | .004 | -.027 | .002 |
| 5 | 5 | 840.0 | -68.0 | -35.0 | 17.0 | 12.0 | .265 | -.062 | -.002 | -.041 | -.003 |
| 6 | 6 | 831.0 | -91.0 | -34.0 | 21.0 | 12.0 | .249 | -.066 | -.006 | -.049 | -.010 |
| 7 | 7 | 822.0 | -114.0 | -33.0 | 25.0 | 11.0 | .233 | -.070 | -.011 | -.058 | -.017 |
| 8 | 8 | 813.0 | -138.0 | -32.0 | 29.0 | 11.0 | .245 | -.062 | -.009 | -.046 | -.011 |
| 9 | 9 | 804.0 | -161.0 | -31.0 | 33.0 | 11.0 | .256 | -.053 | -.007 | -.034 | -.004 |
| 10 | 10 | 789.0 | -183.0 | -29.0 | 36.0 | 10.0 | .268 | -.035 | -.005 | -.015 | .002 |
| 11 | 11 | 775.0 | -205.0 | -27.0 | 40.0 | 9.0 | .280 | -.017 | -.002 | .003 | .007 |
| 12 | 12 | 760.0 | -228.0 | -26.0 | 44.0 | 8.0 | .319 | .018 | .002 | .007 | 0.000 |
| 13 | 13 | 746.0 | -250.0 | -24.0 | 47.0 | 7.0 | .358 | .054 | .005 | .011 | -.007 |
| 14 | 14 | 726.0 | -270.0 | -21.0 | 51.0 | 6.0 | .396 | .093 | .010 | .008 | -.017 |
| 15 | 15 | 707.0 | -290.0 | -18.0 | 54.0 | 5.0 | .434 | .131 | .015 | .005 | -.027 |
| 16 | 16 | 687.0 | -310.0 | -15.0 | 58.0 | 4.0 | .483 | .104 | .009 | .010 | -.022 |
| 17 | 17 | 669.0 | -330.0 | -12.0 | 61.0 | 3.0 | .531 | .077 | .004 | .015 | -.017 |
| 18 | 18 | 642.0 | -342.0 | -13.0 | 63.0 | 4.0 | .595 | .047 | .003 | .008 | -.009 |
| 19 | 19 | 617.0 | -354.0 | -14.0 | 64.0 | 4.0 | .659 | .017 | .002 | .001 | -.001 |
| 20 | 20 | 597.0 | -377.0 | -5.0 | 68.0 | 1.0 | .650 | .016 | -0.000 | -.004 | -0.000 |
| 21 | 21 | 576.0 | -400.0 | 5.0 | 72.0 | -3.0 | .641 | .015 | -.002 | -.009 | .001 |
| 22 | 22 | 552.0 | -415.0 | 12.0 | 74.0 | -5.0 | .637 | .015 | -.002 | -.014 | .002 |
| 23 | 23 | 527.0 | -429.0 | 18.0 | 76.0 | -8.0 | .633 | .016 | -.002 | -.018 | .003 |
| 24 | 24 | 502.0 | -444.0 | 25.0 | 79.0 | -10.0 | .625 | .019 | -.003 | -.017 | .002 |
| 25 | 25 | 478.0 | -458.0 | 32.0 | 81.0 | -13.0 | .617 | .022 | -.004 | -.015 | -0.000 |
| 26 | 26 | 454.0 | -474.0 | 43.0 | 84.0 | -17.0 | .614 | .024 | -.004 | -.011 | -0.000 |
| 27 | 27 | 431.0 | -490.0 | 54.0 | 86.0 | -21.0 | .610 | .026 | -.004 | -.008 | -0.000 |
| | | | | Ta | | | | | ea | | |
| 28 | 1 | 1 26.700 | -.200 | -.100 | -.300 | -0.000 | 28.600 | .300 | -.200 | .700 | -.300 |
| | | | | vg | | | | | vg | | |
| 29 | 1 | 1 -1.200 | .700 | .600 | -.500 | .300 | .300 | -.300 | 0.000 | .100 | .100 |
| 30 | 1 | 2 26.930 | -.400 | -.100 | -.200 | -0.300 | 29.400 | -.100 | -0.000 | -.300 | -.500 |
| 31 | 1 | 2 -1.400 | -.700 | .400 | -1.600 | .300 | .300 | -.900 | -.100 | 0.000 | -.200 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 1 | 3 | 27.000 | -.600 | -.100 | -.100 | -.100 | 30.000 | -.400 | .100 | -.700 | -.700 |
| 33 | 1 | 3 | -1.800 | -2.100 | .200 | -2.400 | .200 | .400 | -1.400 | -.200 | .100 | -.100 |
| 34 | 1 | 4 | 27.100 | -.700 | -.100 | -.100 | -.200 | 30.400 | -.800 | .200 | -.700 | -.800 |
| 35 | 1 | 4 | -2.200 | -3.400 | -.100 | -2.900 | .100 | .700 | -1.900 | -.300 | .200 | .200 |
| 36 | 1 | 5 | 27.200 | -.800 | -.200 | -0.000 | -.300 | 30.600 | -1.200 | .200 | -.700 | -.900 |
| 37 | 1 | 5 | -2.800 | -4.900 | -.400 | -3.100 | .100 | .900 | -2.500 | -.300 | .300 | .500 |
| 38 | 1 | 6 | 27.400 | -.900 | -.400 | .100 | -.300 | 30.400 | -1.600 | -.100 | -.900 | -.800 |
| 39 | 1 | 6 | -3.400 | -5.500 | -.500 | -3.000 | .400 | 1.200 | -3.200 | -.100 | .500 | .800 |
| 40 | 1 | 7 | 27.400 | -1.200 | -.500 | .100 | -.300 | 29.900 | -2.200 | -.300 | -1.200 | -.700 |
| 41 | 1 | 7 | -3.900 | -7.300 | -.500 | -2.700 | .800 | 1.400 | -3.800 | .200 | .700 | .900 |
| 42 | 1 | 8 | 27.100 | -1.800 | -.500 | -.100 | -.300 | 29.300 | -3.200 | -.500 | -1.300 | -.700 |
| 43 | 1 | 8 | -4.300 | -7.800 | -.100 | -1.600 | 1.100 | 1.400 | -3.900 | .400 | .700 | .900 |
| 44 | 1 | 9 | 26.100 | -2.900 | -.400 | -.700 | -.400 | 28.000 | -4.700 | -.500 | -1.900 | -.500 |
| 45 | 1 | 9 | -4.600 | -7.100 | .400 | -.600 | 1.300 | 1.100 | -3.800 | .600 | .700 | .900 |
| 46 | 1 | 10 | 23.600 | -4.500 | -.200 | -2.400 | -.500 | 25.000 | -6.700 | 0.000 | -3.500 | -.200 |
| 47 | 1 | 10 | -4.900 | -6.300 | .700 | .100 | 1.300 | .800 | -3.700 | .600 | .700 | .800 |
| 48 | 1 | 11 | 20.700 | -6.500 | -.100 | -4.100 | -.500 | 21.900 | -8.500 | .500 | -4.800 | .500 |
| 49 | 1 | 11 | -4.900 | -5.400 | .900 | .600 | 1.100 | .500 | -3.700 | .600 | .600 | .800 |
| 50 | 1 | 12 | 18.000 | -9.200 | -.200 | -4.300 | -0.000 | 19.000 | -10.300 | .700 | -5.100 | 1.300 |
| 51 | 1 | 12 | -4.300 | -4.500 | .900 | .800 | .700 | .100 | -3.600 | .500 | .500 | .700 |
| 52 | 1 | 13 | 15.600 | -11.400 | -.400 | -4.300 | .400 | 16.700 | -11.200 | 1.000 | -5.200 | 2.000 |
| 53 | 1 | 13 | -3.400 | -3.500 | .700 | .700 | .200 | -.200 | -3.600 | .300 | .400 | .600 |
| 54 | 1 | 14 | 14.200 | -11.200 | -.800 | -5.000 | .700 | 15.000 | -10.800 | 1.200 | -5.100 | 2.300 |
| 55 | 1 | 14 | -2.100 | -2.800 | .500 | .600 | -.300 | -.400 | -3.500 | .100 | .200 | .500 |
| 56 | 1 | 15 | 13.100 | -11.000 | -1.000 | -5.500 | .600 | 13.500 | -10.200 | 1.400 | -4.900 | 2.500 |
| 57 | 1 | 15 | -.800 | -2.100 | .300 | .300 | -.800 | -.700 | -3.500 | -0.000 | .100 | .400 |
| 58 | 1 | 16 | 11.200 | -13.200 | -.900 | -5.300 | .200 | 11.900 | -10.200 | 1.700 | -4.600 | 2.900 |



# APPENDIX D

## EXAMPLE OF RESTART JOB SUBMISSION

Normally a restart run deck consists of 36 cards, 15 of which are system control cards and the remaining 21 are program parameter cards. System control cards have an * in column 1. A sample run deck is as follows:

```
 1   *JOB,5066,35631002,HUANG/SHIEH
 2   *LIMIT, T=50,PT=20,PR=350,DD80=2500
 3   *ASSIGN,CNSTF=11,D
 4   *ASSIGN,STRTF=12,D
 5   *ASSIGN,HOUTF=13,D
 6   *ASSIGN,EGSLF=14,D
 7   *TLIB,11,BN,BK=2,MS=1,NS
 8   *TLIB,12,BN,BK=2,MS=1,NS
 9   *TLIB,13,BN,BK=2,MS=1,NS
10   *TLIB,14,BN,BK=2,MS=1,NS
11   *ASSIGN,DD80=40
12   *FORTRAN,S=PLIB,N=TOCNLNZ
13   *COSY
14   *RUN,I
15   *****RUN(12) OF TIME-DEPT MODEL FROM AA DAYS=6969.250*******
16     7078.600     0.15    6969.250 1  10.00
17     -25    10  100     0.7200  1.0000000E-04
18      30     5   0
19   11  1  110  1        -1.0000        1.0000
20   B8019
21   12  5    20  4      6932.8000       36.5000
22   B8109    B8110    B8111    B8112    B8113
23   13  5    20  3      6951.4000       18.2500
```

```
B8114    B8115    B8116    B8117    B8118
14   4   250   3      6967.9000         1.5000
B8119    B5365    B5385    B5081
   4
     1 12      8 14     10 1      11 18
   4
     3 22     11 14     13 1      15 22
   4
     4 20      7 14     10 9      14   1
*END
```

The following table describes all the parameters appearing in the input cards

| Card # | Cols. | Format | Parameter | Description |
|---|---|---|---|---|
| 15 | 1-80 | 8A10 | ID | Brief description of this run (title, run # etc.) |
| 16 | 1-10 | F10.3 | DAYEND | Last time-step in days to be calculated in this run |
| | 11-20 | F10.3 | DIFDAY | Increment in days between time-steps |
| | 21-30 | F10.3 | START | Time in days of 2nd record of History Starting File |
| | 31-32 | I2 | LSTART | Switch for listing History Starting File at Days=START |
| | | | | $= 0$ No list |
| | | | | $\neq 0$ List |
| | 33-40 | F8.2 | PRTDAY | Interval in days between DD80 outputs (microfilm). Each output ≈ 150 frames. First output is on days = START + PRTDAY |
| | 41-80 | | | Space for comments |
| 17 | 1-5 | I5 | MSUN | Number of time-steps between Matsuno process |
| | | | | MSUN > 0 = Normal restart |
| | | | | MSUN < 0 = Matsuno restart |
| | 6-10 | I5 | IBSCAN | No. of scans each block per pass |
| | 11-15 | I5 | MSCAN | Total number of scans |
| | 16-25 | F10.4 | ALPHAR | Relaxation coefficient |
| | 26-40 | E15.7 | EPISLON | Convergence criterion |

| Card # | Cols. | Format | Parameter | Description |
|---|---|---|---|---|
| 18 | 1-5 | I5 | MSWP | Maximum number of density adjustment per point |
| | 6-10 | I5 | MCOUNT | Maximum number of unstable points allowed |
| | 11-13 | I3 | IOFR | Whether Fourier constants to be listed<br>= 0 = No list<br>≠ 0 = List (TOCNLNZ only) |
| 19 | 1-2 | I2 | NTAP | Logical unit no. for constant file (CNF) (=11) |
| | 3-5 | I3 | NOTAP | Number of reels of tape provided for CNF |
| | 6-10 | I5 | NRT | No. of records per tape for CNF |
| | 11-13 | I3 | ITAP | Reel no. of CNF tape to be used for this run |
| | 14-23 | F14.4 | BG | Day of CNF record proceeding one to be read (= -1 means read from beginning of tape) |
| | 24-40 | F13.4 | DOUT | <0 = read constant data from cards, write new CNF on tape 11<br>≥0 = read constant data from tape 11<br>Absolute Value = 1 = List constants independent of I & J (block independent)<br>= 2 = List constants dependent of I & J (block dependent)<br>= 3 = List both of above<br>= 0 = No list |
| 20 (22) (24) (26) | | nA8 | MTLAB | The labels of magnetic tapes provided for CNF (=11) in this run. The rest of columns can be used for additional tapes, n is total number of tapes provided (22 for restarting file, 24 for historical climatology file, 26 for energy and selected points file) |

| Card # | Cols. | Format | Parameter | Description |
|---|---|---|---|---|
| 21<br>(23)<br>(25) | | | | Same as card # 19, except for the restarting file (21), for the historical climatology file (23) and for the energy output and selected points file (25) |
| 27 | 1-4 | I4 | MSLCT(1) | Number of points be selected in block #1 |
| 28 | 1-32 | 4(2x,2I3) | LGLTIJ | Blanks + point location (I,J) to be selected in this example. There are 4 points per block |
| 29 | | | | Number of points be selected in block #2 |
| 30 | | | | Same as card # 28 |
| 31 | | | | Number of points be selected in block #3 |
| 32 | | | | Same as card # 28 |

APPENDIX E

EXAMPLE OF OUTPUTS OF A NORMAL RUN

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```
                               *FORTRAN,S=PLIB,N=TOCNLNZ
                               TOCNLNZ     VERSION   17         FILE GENERATED ON 08/ 4 AT  18. 3 HRS
   1                        0        PROGRAM TOCNLNZ
      COMPILE TIME =      693  MILLISECS
 422                        0        SUBROUTINE CSTOUT (D,X,N)                                          CSTO.2
      COMPILE TIME =       10  MILLISECS
 433                        0        SUBROUTINE FLDYST (KDAT,NAMX,NTPX,ITS,LABEL,KNR,DAYF,DAYX,ISTOP,N,
 434                        0       1KTPR)
      COMPILE TIME =      114  MILLISECS
 541                        0        SUBROUTINE RDBJF (NTPX,IDM,X)                                      RDBF.2
      COMPILE TIME =       12  MILLISECS
 556                        0        SUBROUTINE WTBJF (NTPX,IDM,X)                                      WTBF.2
      COMPILE TIME =       12  MILLISECS
 571                        0        SUBROUTINE REQLCM (NIB,KMAX,NDIM1,NDIM2,IDMDB,IDMDC,MAXI)
      COMPILE TIME =       75  MILLISECS
 632                        0        SUBROUTINE REWDTP (NDSKX)                                          REWD.2
      COMPILE TIME =        4  MILLISECS
 640                        0        SUBROUTINE RDBJFL (NDSKX,IDM,X)                                    RDBL.2
      COMPILE TIME =        8  MILLISECS
 656                        0        SUBROUTINE WTBUFL (NDSKX,IDM,X)                                    WTBL.2
      COMPILE TIME =        8  MILLISECS
 672                        0        SUBROUTINE GRDCST                                                  GRDC.2
      COMPILE TIME =      486  MILLISECS
 944                        0        SUBROUTINE CRDINP (N,KSYB,IB,INKD,IMX,JMX,X)                       CRDI.2
      COMPILE TIME =       44  MILLISECS
 981                        0        SUBROUTINE  LSTCSTI (IB)                                           LSTC.2
      COMPILE TIME =      257  MILLISECS
1161                        0        SUBROUTINE INDTABL (KDAT,I2,J2,IB,LSBY,IEF1,IEF2,IMEF1,IMEF2,JMEF1INDT.2
1162                        0       1,JMEF2,IND)                                                        INDT.3
      COMPILE TIME =       43  MILLISECS
1190                        0        SUBROUTINE CHGTAPE (L,LLX)                                         CTAP.2
      COMPILE TIME =       78  MILLISECS
1244                        0        SUBROUTINE GTABOUT (NAMX,NTPX,KDAT,IMAX,JMAX,DAYS,IB,K,LFE,LSBY,X)GTAB.2
      COMPILE TIME =       57  MILLISECS
1290                        0        SUBROUTINE LSTOUT (NAMX,NTPX,KDAT,IMAX,JMAX,LSBY,LFE,DAYX,IB,K,U,VLSTA.2
1291                        0       1,W,S,T)                                                            LSTA.3
      COMPILE TIME =       24  MILLISECS
1309                        0        SUBROUTINE PRTENGX (NTPO,KDAT,ITEM,NJMAX, NJ,XXP)                  PENG.2
      COMPILE TIME =       45  MILLISECS
1363                        0        SUBROUTINE DATPLT (ITEM)                                           DAPL.2
      COMPILE TIME =       35  MILLISECS
1401                        0        SUBROUTINE MPLOT (NTPO,KDAT,ITEM,NJMAX,NJ,XXP,XMIN,XMAX,IR,NPLX,  PLOT.2
1402                        0       1 IPL,FAC,KFASW)                                                    PLOT.3
      COMPILE TIME =      206  MILLISECS
1557                        0        SUBROUTINE PRTDJK (NAMX,JM,KM,X)                                   PRJK.2
      COMPILE TIME =       20  MILLISECS
1574                        0        SUBROUTINE COLDST (NDSKX,NDSKR)                                    COLD.2
      COMPILE TIME =      145  MILLISECS
1668                        0        SUBROUTINE INDINTG (IMAX,JMAX,IND,INDB,L,ING)                      INDC.2
      COMPILE TIME =       15  MILLISECS
1693                        0        SUBROUTINE MAINCL (NDSKP,NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)            MAIN.2
      COMPILE TIME =       87  MILLISECS
1750                        0        SUBROUTINE ACALK32 (NDSKX, NDSKZ,NDSKR,NDSKW)                      ACAL.2
      COMPILE TIME =       99  MILLISECS
1821                        0        SUBROUTINE CMPTA (DAYX,    P,KM1,UA,VA,WA,SA,TA,KB,UB,VB,WB,SB,TB, CPTA.2
1822                        0       1KP1,UC,VC,WC,SC,TC)                                                CPTA.3
      COMPILE TIME =      850  MILLISECS
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2035                   0          SUBROUTINE BINCPMA (KA,UA,VA,WA,SA,TA)                          BINA.2
    COMPILE TIME =    62    MILLISECS
2075                   0          SUBROUTINE ZEROBF (KA,UA,VA,WA,SA,TA)                           ZROF.2
    COMPILE TIME =    63    MILLISECS
2111                   0          SUBROUTINE NONLIN (NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)               NONL.2
    COMPILE TIME =   522    MILLISECS
2329                   0          SUBROUTINE FCALK32 (NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)              FCAL.2
    COMPILE TIME =   114    MILLISECS
2403                   0          SUBROUTINE CMPTF (DAYX,P,KA,UA,VA,WA,SA,TA,KB,UB,VB,WB,SB,TB,KC,UCCPTF.2
2404                   0         1,VC,WC,SC,TC)                                                   CPTF.3
    COMPILE TIME =   667    MILLISECS
2636                   0          SUBROUTINE QTEMPF (S,T,QTX,EMPX)                                QTEP.2
    COMPILE TIME =    57    MILLISECS
2672                   0          SUBROUTINE RELAX (NDSKR,NDSKW)                                  RELX.2
    COMPILE TIME =   277    MILLISECS
2815                   0          SUBROUTINE CNTX (NDSKX,NDSKY,NDSKZ,NDSKR,NDSKW)                 CNTX.2
    COMPILE TIME =   267    MILLISECS
2966                   0          SUBROUTINE ADVCO (DAYX,IB,KB,U,V,S,T)                           ADVC.2
    COMPILE TIME =   193    MILLISECS
3062                   0          SUBROUTINE CALCAJ (DAYX,IB,KA,SA,TA,KB,SB,TB,KC,SC,TC)          AJST.2
    COMPILE TIME =   194    MILLISECS
3160                   0          SUBROUTINE WUVCAL (NDSKX,NDSKZ,NDSKR)                           WUVC.2
    COMPILE TIME =   621    MILLISECS
3399                   0          SUBROUTINE WFLOUT (NDSKX,NDSKZ)                                 WFLO.2
    COMPILE TIME =   194    MILLISECS
3506                   0          SUBROUTINE FRCST (NTPF, SWFR,IOFR)
    COMPILE TIME =   217    MILLISECS
3620                   0          SUBROUTINE QTSTXY (JSWC,T)
    COMPILE TIME =   296    MILLISECS
3746                   0          SUBROUTINE FRPRT (KDAT,I,JMAX,MAXFR,KIND,NAMFR,XAB)
    COMPILE TIME =    18    MILLISECS
3757                   0          SUBROUTINE CALCKO (LTYPE,NDSKR,NDSKW)                           CALO.2
        REPLACE 1,12
        *****RUN(1) OF TIME-DEPT MODEL FROM AA DAYS=5958.100**********
          6018.100      0.15   5958.100 1  10.00
          -25   10  100     0.7200  1.0000000E-04
           30    5
        11  1  110  1         -1.0000       -1.0000
        B8019
        12  5   20  1         -1.0000       20.0000
        B8109   B8110   B8111   B8112   B8113
        13  5   20  1         -1.0000       10.0000
        B8114   B8115   B8116   B8117   B8118
        14  1 3000  1         -1.0000        1.0000
        B8119
        REPLACE 23
            2.5000     0.2000     0.3000     5.0000     0.8000     1.0000
    COMPILE TIME =    72    MILLISECS

  PROGRAM SPACE IS 137736

ORIGIN     ENTRY POINTS AND LOCATIONS
 11224       TOCNLNZ  11236
 71256       CSTOUT   71266
 71325       FLDYST   71352
 72313       RDBUF    72313
 72422       WTBUF    72422
 72531       REQLCM   72531
101133       REWDTP  101133
101147       RDBUFL  101147
101177       WTBUFL  101177
101227       GROCST  101233
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103136    CRDINP   103141
103370    LSTCSTI  103370
105104    INDTABL  105104
105371    CHGTAPE  105403
105735    GTABOUT  105760
106256    LSTOUT   106266
106515    PRTENGX  106533
107016    DATPLT   107016
107202    MPLOT    107243
110335    PRTOJK   110335
110451    COLDST   111627
112211    INDINTG  112211
112267    MAINCL   112267
112675    ACALK32  112675
113242    CMPTA    113244
115110    BINCPMA  115110
115173    ZEROBF   115173
115250    NONLIN   115262
116453    FCALK32  116463
117025    CMPTF    117025
120652    QTEMPF   120662
120731    RELAX    120731
121545    CNTX     121545
122435    ADVCO    122436
122773    CALCAJ   123005
123470    WUVCAL   123470
125072    MFLOUT   125072
125535    FRCST    125570
126374    QTSTXY   126500
127324    FRPRT    127324
127453    CALCKO   127453
127610    Q8QERR   127610
127622    Q8QIOU   127622
127767    Q8QRSD   130002    NUMP     130013
130016    ALOG     130017    LOGF     130017
130061    EXIT     130074    END      130074    STOP     130064
130101    EXP      130111    EXPF     130111
130161    INPUTC   130161
130604    KODER    130604
131634    KRAKER   131634
132434    OUTPTC   132434
133065    COS      133065    SIN      133071    COSF     133065    SINF     133071
133152    SQRT     133152    SQRTF    133152
133203    ALOG10   133204
133257    BACKSP   133257    REWINM   133334    IFENDF   133344
133403    BUFFEI   133403    BUFFEO   133425    LENGTHF  133463    IOCHEK   133503
133655    CLOCKF   133672    DATEF    133665
133677    LCMRD    133734    LCMWT    133737    LCMREQ   133677
133754    NEWVOL   133757    NEWLAB   133754
135043    FRSTPT   135063    VECTOR   135136    POINT    135147    CURVE    135160    LINE     135221    Q8QTRN   135241
          Q8QP42   135321    Q8QFLB   135334    Q8QWRB   135404    Q8QERP   135460
136413    OUTPTS   136413
136706    FRAME    136706
136755    OPTN     136763
137144    PWRI     137150
137467    PWRT     137467
137524    Q8QSDA   137524
137533    RBAREX   137552
137655    ULIBER   137655

   COMMON BLOCKS    LOCATION
                         4    CMN1      14601    CMN2      31503    CMN3      43034    NLCM      66362    ENSL      66742
          QTST       73050    CPL      107126    Q8QPPC   135471
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OVERALL CORE USE STATISTICS   (DECIMAL)

THE MAXIMUM SCM IS                  54144
THE PROGRAM CURRENTLY USES          49134
THE LOADING PROCESS USED            52067
THE MAXIMUM LCM IS                 468686
THE PROGRAM CURRENTLY USES          81911
 LCM AREA MAP BY BUFFER TYPE
        MISC        185  SYSIOU        16  RD          2048  PR          2048  SYSINS      2048
        SYSMOP     2048  PLIB        1536  RANFO         64  CNSTF       4288  STRTF       4288
        MOUTF      4288  EGSLF       4288  SYSLB0      1024  SYSLB1      1024  SYSLB2      1024
        SYSLB3     1024  SYSSAT       512  SYSDM1      1024  SYSSCM     49134
```

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========== LCM ADDRESS TABLE FOR BOTH BKY-FTN AND NCAR SYSTEMS ==========

LCMFRO =         0  00000000000000000000

LCMFR(I) =
   1)       271  00000000000000000417    2)       812  00000000000000001454    3)      1353  00000000000000002511
   4)      1894  00000000000000003546    5)      2435  00000000000000004603    6)      2976  00000000000000005640
   7)      3517  00000000000000006675    8)      4058  00000000000000007732    9)      4599  00000000000000010767
  10)      5140  00000000000000012024   11)      5681  00000000000000013061   12)      6222  00000000000000014116
  13)      6763  00000000000000015153   14)      7304  00000000000000016210   15)      7845  00000000000000017245
  16)      8386  00000000000000020302   17)      8927  00000000000000021337   18)      9468  00000000000000022374
  19)     10009  00000000000000023431   20)     10550  00000000000000024466   21)     11091  00000000000000025523
  22)     11632  00000000000000026560   23)     12173  00000000000000027615   24)     12714  00000000000000030652
  25)     13255  00000000000000031707   26)     13796  00000000000000032744   27)     14337  00000000000000034001
  28)     14878  00000000000000035036   29)     15419  00000000000000036073   30)     15960  00000000000000037130
  31)     16501  00000000000000040165   32)     17042  00000000000000041222   33)     17583  00000000000000042257
  34)     18124  00000000000000043314   35)     18665  00000000000000044351   36)     19206  00000000000000045406
  37)     19747  00000000000000046443   38)     20288  00000000000000047500   39)     20829  00000000000000050535
  40)     21370  00000000000000051572   41)     21911  00000000000000052627   42)     22452  00000000000000053664
  43)     22993  00000000000000054721   44)     23534  00000000000000055756   45)     24075  00000000000000057013
  46)     24616  00000000000000060050   47)     25157  00000000000000061105   48)     25698  00000000000000062142
  49)     26239  00000000000000063177   50)     26780  00000000000000064234   51)     27321  00000000000000065271
  52)     27862  00000000000000066326   53)     28403  00000000000000067363   54)     28944  00000000000000070420
  55)     29485  00000000000000071455   56)     30026  00000000000000072512   57)     30567  00000000000000073547
  58)     31108  00000000000000074604   59)     31649  00000000000000075641   60)     32190  00000000000000076676
  61)     32731  00000000000000077733   62)     33272  00000000000000100770   63)     33813  00000000000000102025
  64)     34354  00000000000000103062   65)     34895  00000000000000104117

     LCM NAME REQUEST --- L, LCNT(L), IRMX =      1      0     33

   I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.      I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.      I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.
   1)      35436  00000000000000105154    2)      36060  00000000000000106334    3)      39166  00000000000000114376
   4)      42272  00000000000000122440    5)      45378  00000000000000130502    6)      48484  00000000000000136544
   7)      51590  00000000000000144606    8)      54696  00000000000000152650    9)      57802  00000000000000160712
  10)      60908  00000000000000166754   11)      64014  00000000000000175016   12)      67120  00000000000000203060
  13)      67744  00000000000000204240   14)      70850  00000000000000212302   15)      73956  00000000000000220344
  16)      77062  00000000000000226406   17)      80168  00000000000000234450   18)      83274  00000000000000242512
  19)      86380  00000000000000252554   20)      89486  00000000000000256616   21)      92592  00000000000000264660
  22)      95698  00000000000000272722   23)      98804  00000000000000300764   24)      99428  00000000000000302144
  25)     102534  00000000000000310206   26)     105640  00000000000000316250   27)     108746  00000000000000324312
  28)     111852  00000000000000332354   29)     114958  00000000000000340416   30)     118064  00000000000000346460
  31)     121170  00000000000000354522   32)     124276  00000000000000362564   33)     127382  00000000000000370626

     LCM NAME REQUEST --- L, LCNT(L), IRMX =      2      0     33

   I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.      I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.      I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.
   1)     130488  00000000000000376670    2)     131112  00000000000000400050    3)     134218  00000000000000406112
   4)     137324  00000000000000414154    5)     140430  00000000000000422216    6)     143536  00000000000000430260
   7)     146642  00000000000000436322    8)     149748  00000000000000444364    9)     152854  00000000000000452426
  10)     155960  00000000000000460470   11)     159066  00000000000000466532   12)     162172  00000000000000474574
  13)     162796  00000000000000475754   14)     165902  00000000000000504016   15)     169008  00000000000000512060
  16)     172114  00000000000000520122   17)     175220  00000000000000526164   18)     178326  00000000000000534226
  19)     181432  00000000000000542270   20)     184538  00000000000000550332   21)     187644  00000000000000556374
  22)     190750  00000000000000564436   23)     193856  00000000000000572500   24)     194480  00000000000000573660
  25)     197586  00000000000000601722   26)     200692  00000000000000607764   27)     203798  00000000000000616026
  28)     206904  00000000000000624070   29)     210010  00000000000000632132   30)     213116  00000000000000640174
  31)     216222  00000000000000646236   32)     219328  00000000000000654300   33)     222434  00000000000000662342

     LCM NAME REQUEST --- L, LCNT(L), IRMX =      3      0     33

   I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.      I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.      I  LCMNAM(I,L)  LCMNAM(I,L) IN OCT.
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 1)     225540  00000000000000670404    2)     226164  00000000000000671564    3)     229270  00000000000000677626
 4)     232376  00000000000000705670    5)     235482  00000000000000713732    6)     238588  00000000000000721774
 7)     241694  00000000000000730036    8)     244800  00000000000000736100    9)     247906  00000000000000744142
10)     251012  00000000000000752204   11)     254118  00000000000000760246   12)     257224  00000000000000766310
13)     257848  00000000000000767470   14)     260954  00000000000000775532   15)     264060  00000000000001003574
16)     267166  00000000000001011636   17)     270272  00000000000001017700   18)     273378  00000000000001025742
19)     276484  00000000000001034004   20)     279590  00000000000001042046   21)     282696  00000000000001050110
22)     285802  00000000000001056152   23)     288908  00000000000001064214   24)     289532  00000000000001065374
25)     292630  00000000000001073436   26)     295744  00000000000001101500   27)     298850  00000000000001107542
28)     301956  00000000000001115604   29)     305062  00000000000001123646   30)     308168  00000000000001131710
31)     311274  00000000000001137752   32)     314380  00000000000001146014   33)     317486  00000000000001154056

    LCM NAME REQUEST --- L, LCNT(L), IRNK =      4      0      35

 I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.
 1)          R  60000000000000400000    2)          R  60000000000000400000    3)          R  60000000000000400000
 4)          R  60000000000000400000    5)          R  60000000000000400000    6)          R  60000000000000400000
 7)          R  60000000000000400000    8)          R  60000000000000400000    9)          R  60000000000000400000
10)          R  60000000000000400000   11)          R  60000000000000400000   12)          R  60000000000000400000
13)          R  60000000000000400000   14)          R  60000000000000400000   15)          R  60000000000000400000
16)          R  60000000000000400000   17)          R  60000000000000400000   18)          R  60000000000000400000
19)          R  60000000000000400000   20)          R  60000000000000400000   21)          R  60000000000000400000
22)          R  60000000000000400000   23)          R  60000000000000400000   24)          R  60000000000000400000
25)          R  60000000000000400000   26)          R  60000000000000400000   27)          R  60000000000000400000
28)          R  60000000000000400000   29)          R  60000000000000400000   30)          R  60000000000000400000
31)          R  60000000000000400000   32)          R  60000000000000400000   33)          R  60000000000000400000

    LCM NAME REQUEST --- L, LCNT(L), IRNK =      5      0      3

 I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.
 1)     320592  00000000000001162120    2)     322605  00000000000001166055    3)     324618  00000000000001172012

    LCM NAME REQUEST --- L, LCNT(L), IRNK =      6      0      3

 I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.
 1)     326631  00000000000001175747    2)     329115  00000000000001202633    3)     331599  00000000000001207517

    LCM NAME REQUEST --- L, LCNT(L), IRNK =      7      0      3

 I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.     I  LCMNAM(I,L)   LCMNAM(I,L) IN OCT.
 1)     326631  00000000000001175747    2)     329115  00000000000001202633    3)     331599  00000000000001207517




               *****RUN(1) OF TIME-DEPT MODEL FROM AA DAYS=5950.100**********

DATE OF JOB RUN --08/26/76
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     *****RUN(1) OF TIME-DEPT MODEL FROM AA DAYS=5958.100*********

DATE OF JOB RUN --08/06/76

                ***********INPUT DATA AND CALCULATED CONSTANTS**********

   MAXI, NIB, IMAX, JMAX, KMAX =    65    3   23   27   10


     IDMDA,IDMDB,IDMDC,IDMDD, NDIM,NDIM1,NDIM2=   2812   2013   2484    619    621    624   3106

     ENDING DAYS = DAYEND =  6018.10000 (DAYS)
     TIME STEP IN  DAYS    = DIFDAY =       .15000 (DAYS)
     TIME STEP IN SECONDS = DTIME1 =  1.29600000E+04(SEC)
     CONTROL NO. OF STARTING-DAYS = START =  5958.10000 (DAYS)
          -----COLD START (DAYS=0.0), IF START .LT. 0.0 -----
     CONTROL NO. WHETHER (RE-) START INPUT VALUE OF P,U,V,W,S,T TO BE LISTED = LSTART =  1
     NO. OF  **DAYS**  PER PRINT-OUTPUT = PRTDAY =        10.00000 (DAYS)
     NO. OF TIME-STEPS PER PRINT-OUTPUT =  LOOP  =         67

     NO. OF TIME-STEPS PER STABLIZING (MATSUNO) CALCULATION = MSUN =  -25
          ---- MSUN = (POSITIVE, NEGATIVE) = (NORMAL START, MATSUNO START) ----

     MAXIMUM NO. OF SCANNING (RELAXATION) PER BLOCK = IBSCAN =   10
     MAXIMUM NO. OF BLOCK SCANNING = MSCAN =  100
     SCANNING ADJUSTABLE PARAMETER = ALPHAR =      .7200
     MAXIMUM ERROR ALLOWED IN RELAXATION = EPSL =  1.00000000E-04
     WEIGHT FACTOR = PWGT =     4.0000

     DENSITY ADJUST PARAMETER, MSWP = MAXIMUM NO. OF ADJUST PER POINT =   30
     DENSITY ADJUST PARAMETER, MCOUNT = MAXIMUM NO. OF UNSTABLE POINTS PER BLOCK ALLOWED =    5

     *********WHETHER FOURIER CONSTANTS TO BE LISTED, IOFR =  -0


CONTROL DATA FOR TAPE OF  $$$  CONSTANT-DATA  FILE $$$

     TAPE LOGICAL UNIT = NTAP(1) =11
     NO. OF TAPES ASSIGNED TO THIS FILE = NOTAP(1) =  1
     MAXIMUM NO. OF USER#S GROUP-RECORD PER TAPE = NRT(1) =  110
     SEQUENCE NO. OF THE TAPE FOR STARTING = ITAP(1) = 1
     NO. OF LOGICAL RECORDS PER USER#S GROUP-RECORD = KNR(1) =  70
     BEGINING-CONTROL NO. IN DAYS = BG(1) =        -1.00000

     LABEL OF MAGNETIC TAPE(S) ASSIGNED TO THIS FILE ARE
             1) 88019

     CONTROL NO. WHETHER CONSTANTS-FILE TO BE LISTED = DOUT(1) =       -1.00000
     ----CARD-INPUT NEEDED IF DOUT(1) .LT. 0.0----
     WHICH PART NEEDED TO BE LISTED = LSTDA =   1


CONTROL DATA FOR TAPE OF  ***HISTORY-STARTING FILE ***

     TAPE LOGICAL UNIT = NTAP(2) =12
     NO. OF TAPES ASSIGNED TO THIS FILE = NOTAP(2) =  5
     MAXIMUM NO. OF USER#S GROUP-RECORD PER TAPE = NRT(2) =   20
     SEQUENCE NO. OF THE TAPE FOR STARTING = ITAP(2) = 1
     NO. OF LOGICAL RECORDS PER USER#S GROUP-RECORD = KNR(2) =  33
     BEGINING-CONTROL NO. IN DAYS = BG(2) =        -1.00000

     LABEL OF MAGNETIC TAPE(S) ASSIGNED TO THIS FILE ARE
             1) 88109          2) 88110          3) 88111          4) 88112          5) 88113
```

```
     NO. OF DAYS PER OUTPUT (TO TAPE)  = DOUT(2) =        20.00000
     NO. OF TIME-STEPS OUTPUT TO TAPE = LOW(2) = 133

CONTROL DATA FOR TAPE OF  *** HISTORY-OUTPUT  FILE ***

     TAPE LOGICAL UNIT = NTAP(3) =13
     NO. OF TAPES ASSIGNED TO THIS FILE = NOTAP(3) =  5
     MAXIMUM NO. OF USER$S GROUP-RECORD PER TAPE = NRT(3) =   20
     SEQUENCE NO. OF THE TAPE FOR STARTING = ITAP(3) = 1
     NO. OF LOGICAL RECORDS PER USER$S GROUP-RECORD = KNR(3) =  33
     BEGINING-CONTROL NO. IN DAYS = BG(3) =        -1.00000

     LABEL OF MAGNETIC TAPE(S) ASSIGNED TO THIS FILE ARE
             1) B8114          2) B8115          3) B8116          4) B8117          5) B8118

     NO. OF DAYS PER OUTPUT (TO TAPE)  = DOUT(3) =        10.00000
     NO. OF TIME-STEPS OUTPUT TO TAPE = LOW(3) =  67

CONTROL DATA FOR TAPE OF  ---  ENERGY-SELECT  FILE ---

     TAPE LOGICAL UNIT = NTAP(4) =14
     NO. OF TAPES ASSIGNED TO THIS FILE = NOTAP(4) =  1
     MAXIMUM NO. OF USER$S GROUP-RECORD PER TAPE = NRT(4) = 3000
     SEQUENCE NO. OF THE TAPE FOR STARTING = ITAP(4) = 1
     NO. OF LOGICAL RECORDS PER USER$S GROUP-RECORD = KNR(4) =   4
     BEGINING-CONTROL NO. IN DAYS = BG(4) =        -1.00000

     LABEL OF MAGNETIC TAPE(S) ASSIGNED TO THIS FILE ARE
             1) B8119

     NO. OF DAYS PER OUTPUT (TO TAPE)  = DOUT(4) =         1.00000
     NO. OF TIME-STEPS OUTPUT TO TAPE = LOW(4) =   7

  FOR BLOCK  1, NO. OF (I,J) POINTS TO BE SELECTED = MSLCT( 1)=   4

1 ( 1,12)   2 ( 8,14)   3 (10, 1)   4 (11,18)

  FOR BLOCK  2, NO. OF (I,J) POINTS TO BE SELECTED = MSLCT( 2)=   4

1 ( 3,22)   2 (11,14)   3 (13, 1)   4 (15,22)

  FOR BLOCK  3, NO. OF (I,J) POINTS TO BE SELECTED = MSLCT( 3)=   4

1 ( 4,20)   2 ( 7,14)   3 (10, 9)   4 (14, 1)

  ----------BEGIN TO USE THE   1-TH REEL OF TAPE11 LABEL =B8019
          TLIB TO BE ASSIGNED ----- *TLIB  11      BN      BK=2    NS=1    NS      DT              0




     30/06/76               (DAYS) -- LISTING OF TAPE11,    $$$ CONSTANT-DATA  FILE $$$

          TAPE SEQUENCE NO. = 1     LABEL=B8019
```

```
08/06/76                    (DAYS) -- LISTING OF TAPE11,    $$$  CONSTANT-DATA  FILE $$$

          TAPE SEQUENCE NO. = 1      LABEL=88019

  NO.    DAYS    RUN-DATE     NO.    DAYS    RUN-DATE     NO.    DAYS    RUN-DATE     NO.    DAYS    RUN-DATE
 ===== ========== ==========  ===== ========== ==========  ===== ========== ==========  ===== ========== ==========
 ===== ========== ==========  ===== ========== ==========  ===== ========== ==========  ===== ========== ==========

          INPUT FILE READ FROM TAPE11
          TOTAL NO. OF RECORDS READ =     0
          NO. OF USER#S GROUP-RECORDS READ =    0
          NO. OF RECORDS PER USER#S GROUP-RECORD =   70

          ---DAYS--- OF LAST GROUP-RECORD READ =            I
          FINAL ---DAYS--- ASSIGNED TO BE READ =      -1.0000

          ========END OF FILE HAS NOT BEEN REACHED.========


 TAPE11 $$$  CONSTANT-DATA  FILE $$$  HAS BEEN READ TILL    0-TH GROUP-RECORD OF DAYF=      -1.00000, DAYK=

 Z(K), DEPTH  (IN UNIT OF METER)
           10.5000   30.0000   60.0000  100.0000  150.0000  225.0000  350.0000  700.0000 1500.0000 3000.0000
          4000.0000

 VISY,SVISY,TVISY,VISZ,SVISZ,TVISZ =    2.5000     .2000     .3000    5.0000     .8000    1.0000

 FLAT1,FLAT2, FLONG1,FLONG2   =    0.0000    1.1345    0.0000    2.7925

 TO,SO,ROO,ALPHA,B,HEATC=  5.0000000E+00  3.4720000E+01  1.0276000E+00  2.7500000E-04  7.5000000E-04  9.5800000E-01

 CONSTANTS DEFINED IN DATA STATEMENT IN SUBROUTINE GRDCST ---
          G = GRAVITATIONAL ACCELERATION = 981.000 (CM/SEC/SEC)
          RE= RADIUS OF EARTH =  6.37500000E+08 (CM)
         TKK=0.0 DEGREE C = 273.200 (DEGREE KELVIN)
          PI=    3.14159260

 CSTQ, CSTE, SECDAY, POWER  =  9.84440800E-01  7.77600000E+06  8.64000000E+04  1.33333333E+00

 DAYB, KDATB =   5958.2500     08/06/76

 IMAXT, NIB, NIBT, IUNDF=(IUNDF),                              RUNDF=(RUNDF)
    65    3    4     -99=(777777777777777777634) -0.0              =(77777777777777777777)


          TOTAL EFFECTIVE  AREA  ABOUT FULL-GRID POINT (FOR ALL BLOCKS) = TAREA =          IIIII CM**2
          TOTAL EFFECTIVE VOLUME ABOUT HALF-GRID POINT (FOR ALL BLOCKS) =  TVOL =          IIIII CM**3
          TOTAL EFFECTIVE. AREA  ABOUT HALF-GRID POINT (FOR ALL BLOCKS) = UAREA =          IIIII CM**2
          TOTAL EFFECTIVE VOLUME ABOUT FULL-GRID POINT (FOR ALL BLOCKS) =  UVOL =          IIIII CM**3

DYT
           1)  2.78161845E+07

DYU
           1)  2.78161845E+07

RDYJ2
           1)  1.79751468E-08
```

```
DXT(J)
   1)  2.78161845E+07    2)  2.77897096E+07    3)  2.77103355E+07    4)  2.75782132E+07    5)  2.73935941E+07
   6)  2.71568299E+07    7)  2.68683710E+07    8)  2.65287667E+07    9)  2.61386634E+07   10)  2.56988036E+07
  11)  2.52100247E+07   12)  2.46732571E+07   13)  2.40895225E+07   14)  2.34599322E+07   15)  2.27856845E+07
  16)  2.20680631E+07   17)  2.13084338E+07   18)  2.05082427E+07   19)  1.96690129E+07   20)  1.87923421E+07
  21)  1.78798990E+07   22)  1.69334206E+07   23)  1.59547083E+07   24)  1.49456254E+07   25)  1.39080927E+07
  26)  1.28440851E+07   27)  1.17556280E+07

DXU(J)
   1)  2.78029471E+07    2)  2.77500226E+07    3)  2.76442743E+07    4)  2.74859037E+07    5)  2.72752120E+07
   6)  2.70126004E+07    7)  2.66985688E+07    8)  2.63337150E+07    9)  2.59187335E+07   10)  2.54544141E+07
  11)  2.49416409E+07   12)  2.43813898E+07   13)  2.37747274E+07   14)  2.31228084E+07   15)  2.24268738E+07
  16)  2.16882484E+07   17)  2.09083382E+07   18)  2.00886278E+07   19)  1.92306775E+07   20)  1.83361206E+07
  21)  1.74066598E+07   22)  1.64440644E+07   23)  1.54501669E+07   24)  1.44268590E+07   25)  1.33760889E+07
  26)  1.22998565E+07   27)  0.0

RDXU2(J)
   1)  1.79837051E-08    2)  1.80180034E-08    3)  1.80869280E-08    4)  1.81911429E-08    5)  1.83316632E-08
   6)  1.85098803E-08    7)  1.87275956E-08    8)  1.89870666E-08    9)  1.92910661E-08   10)  1.96429585E-08
  11)  2.00467965E-08   12)  2.05074446E-08   13)  2.10307354E-08   14)  2.16236710E-08   15)  2.22946811E-08
  16)  2.30539595E-08   17)  2.39139044E-08   18)  2.48897040E-08   19)  2.60001240E-08   20)  2.72685816E-08
  21)  2.87246379E-08   22)  3.04061080E-08   23)  3.23621100E-08   24)  3.46575785E-08   25)  3.73801344E-08
  26)  4.06508806E-08   27)  0.0

AJKY(J)
   1)  7.73371904E+14    2)  7.71899747E+14    3)  7.68958235E+14    4)  7.64552967E+14    5)  7.58692329E+14
   6)  7.51387477E+14    7)  7.42652316E+14    8)  7.32503475E+14    9)  7.20960272E+14   10)  7.08044679E+14
  11)  6.93781284E+14   12)  6.78197236E+14   13)  6.61322202E+14   14)  6.43188303E+14   15)  6.23830059E+14
  16)  6.03284319E+14   17)  5.81590193E+14   18)  5.58788977E+14   19)  5.34924074E+14   20)  5.10040913E+14
  21)  4.84186860E+14   22)  4.57411130E+14   23)  4.29764692E+14   24)  4.01300173E+14   25)  3.72071756E+14
  26)  3.42135079E+14   27)  0.0

    F(J)
   1)  3.17259462E-06    2)  9.51174464E-06    3)  1.58327885E-05    4)  2.21236938E-05    5)  2.83724853E-05
   6)  3.45672683E-05    7)  4.06962504E-05    8)  4.67477650E-05    9)  5.27102925E-05   10)  5.85724830E-05
  11)  6.43231774E-05   12)  6.99514290E-05   13)  7.54465241E-05   14)  8.07980025E-05   15)  8.59956773E-05
  16)  9.10296544E-05   17)  9.58933514E-05   18)  1.00568516E-04   19)  1.05055242E-04   20)  1.09341990E-04
  21)  1.13420599E-04   22)  1.17283305E-04   23)  1.20922757E-04   24)  1.24332024E-04   25)  1.27504619E-04
  26)  1.30434502E-04   27)  1.30434502E-04

BETA(J)
   1)  0.0               2)  3.16957501E-06    3)  3.16052194E-06    4)  3.14545263E-06    5)  3.12439578E-06
   6)  3.09739146E-06    7)  3.06449108E-06    8)  3.02575727E-06    9)  2.98126376E-06   10)  2.93109524E-06
  11)  2.87534722E-06   12)  2.81412591E-06   13)  2.74754755E-06   14)  2.67573918E-06   15)  2.59883739E-06
  16)  2.51698856E-06   17)  2.43034850E-06   18)  2.33908214E-06   19)  2.24336320E-06   20)  2.14337389E-06
  21)  2.03930455E-06   22)  1.93135327E-06   23)  1.81972556E-06   24)  1.70463389E-06   25)  1.58629736E-06
  26)  1.46494122E-06   27)  0.0

SVISX(J)
   1)  2.00000000E+07    2)  1.99746233E+07    3)  1.98985897E+07    4)  1.97721889E+07    5)  1.95959027E+07
   6)  1.93704041E+07    7)  1.90965553E+07    8)  1.87754058E+07    9)  1.84081899E+07   10)  1.79963235E+07
  11)  1.75414011E+07   12)  1.70451920E+07   13)  1.65096364E+07   14)  1.59368416E+07   15)  1.53290777E+07
  16)  1.46887737E+07   17)  1.40185133E+07   18)  1.33210313E+07   19)  1.25992107E+07   20)  1.18560803E+07
  21)  1.10948134E+07   22)  1.03187283E+07   23)  9.53129133E+06   24)  8.73612239E+06   25)  7.93700559E+06
  26)  7.13790586E+06   27)  6.34299495E+06

SVISY
   1)  2.00000000E+07

SVISZ
   1)  8.00000000E-01

TVISX(J)
   1)  3.00000000E+07    2)  2.99619349E+07    3)  2.98478845E+07    4)  2.96582833E+07    5)  2.93938541E+07
   6)  2.90556061E+07    7)  2.86448329E+07    8)  2.81631087E+07    9)  2.76122848E+07   10)  2.69944853E+07
  11)  2.63121017E+07   12)  2.55677880E+07   13)  2.47644545E+07   14)  2.39052623E+07   15)  2.29936166E+07
  16)  2.20331606E+07   17)  2.10277699E+07   18)  1.99815469E+07   19)  1.88988161E+07   20)  1.77841205E+07
  21)  1.66422201E+07   22)  1.54780925E+07   23)  1.42969370E+07   24)  1.31041836E+07   25)  1.19055084E+07
  [illegible]            [illegible]
```

```
               TOTAL EFFECTIVE  AREA  ABOUT FULL-GRID POINT (FOR ALL BLOCKS) = TAREA =  7.46508011E+17 CM**2
               TOTAL EFFECTIVE VOLUME ABOUT HALF-GRID POINT (FOR ALL BLOCKS) =  TVOL =  2.98603204E+23 CM**3
               TOTAL EFFECTIVE  AREA  ABOUT HALF-GRID POINT (FOR ALL BLOCKS) = UAREA =  7.46508011E+17 CM**2
               TOTAL EFFECTIVE VOLUME ABOUT FULL-GRID POINT (FOR ALL BLOCKS) =  UVOL =  2.98603204E+23 CM**3

*****    1-TH GROUP-RECORD (DAYB=     5958.25000) OF  $$$  CONSTANT-DATA  FILE $$$  HAS BEEN WRITTEN ON TAPE11 == B8019

     *****PARTIAL FILLED TAPE OF  $$$  CONSTANT-DATA  FILE $$$    TAPE LOGICAL NO.=11
REEL NO.=   1 (LABEL=B8019    =B8019   )  NO. OF MAXIMUM GROUP-RECORDS PER TAPE=   110,  NO. OF GROUP-RECORDS WRITTEN=

     ********** TAPE11 IS NO LONGER NEEDED FOR THIS RUN.

     ----------BEGIN TO USE THE   1-TH REEL OF TAPE12 LABEL =B0109
               TLIB TO BE ASSIGNED ----- *TLIB   12       BN       BK=2    MS=1    RT      DT             0
```

```
08/06/76                 (DAYS) -- LISTING OF TAPE12,    ***HISTORY-STARTING FILE ***

          TAPE SEQUENCE NO. = 1      LABEL=B0139

 NO.     DAYS      RUN-DATE      NO.      DAYS      RUN-DATE      NO.      DAYS      RUN-DATE      NO.      DAYS      RUN-DATE
***** ********** **********     ***** ********** **********     ***** ********** **********     ***** ********** **********
***** ********** **********     ***** ********** **********     ***** ********** **********     ***** ********** **********

          INPUT FILE READ FROM TAPE12
          TOTAL NO. OF RECORDS READ =     0
          NO. OF USERNS GROUP-RECORDS READ =     0
          NO. OF RECORDS PER USERNS GROUP-RECORD =    33

          ---DAYS--- OF LAST GROUP-RECORD READ =              1
          FINAL ---DAYS--- ASSIGNED TO BE READ =      -1.0000

          ********END OF FILE HAS NOT BEEN REACHED.********


 TAPE12 ***HISTORY-STARTING FILE ***  HAS BEEN READ TILL    0-TH GROUP-RECORD OF DAYF=      -1.00000, DAYX=


      RE-START INPUT BLOCKED DATA OF (P,U,V,W,S,T) BELONG TO     5957.9200 DAYS, AND     5958.1000 DAYS
      TIME-STEP BETWEEN THE INPUT DATA =          .1000 DAYS

      ------ FOR NONSUNO-RESTART (NSUN .LT. 0), ONLY THE DATA OF     5958.1000 DAYS IS USED AS INITIAL VALUE -----
       AND  TIME-STEP = DIFDAY =          .1500 DAYS

 ----------BEGIN TO USE THE   1-TH REEL OF TAPE13 LABEL =B0114
          TLIB TO BE ASSIGNED ----- *TLIB   13      BN       BK=2    NS=1    NS      DT            0










08/06/76                 (DAYS) -- LISTING OF TAPE13,    *** HISTORY-OUTPUT  FILE ***
```

```
08/06/76                  (DAYS) -- LISTING OF TAPE14,    --- ENERGY-SELECT  FILE ---

         TAPE SEQUENCE NO. = 1     LABEL=B8119

   NO.     DAYS     RUN-DATE     NO.     DAYS     RUN-DATE     NO.     DAYS     RUN-DATE  /  NO.     DAYS     RUN-DATE
  ===== ========== ==========   ===== ========== ==========   ===== ========== ==========   ===== ========== ==========
  ===== ========== ==========   ===== ========== ==========   ===== ========== ==========   ===== ========== ==========

         INPUT FILE READ FROM TAPE14
         TOTAL NO. OF RECORDS READ =     0
         NO. OF USER#S GROUP-RECORDS READ =     0
         NO. OF RECORDS PER USER#S GROUP-RECORD =     4

         ---DAYS--- OF LAST GROUP-RECORD READ =   5957.9200
         FINAL ---DAYS--- ASSIGNED TO BE READ =     -1.0000

         ========END OF FILE HAS NOT BEEN REACHED.========


   TAPE14 ---  ENERGY-SELECT  FILE ---  HAS BEEN READ TILL    0-TH GROUP-RECORD OF DAYF=      -1.00000, DAYK=    5957.92000

4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    1, DAYS=   5959.1500
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    2, DAYS=   5960.2000
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    3, DAYS=   5961.2500
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    4, DAYS=   5962.3000
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    5, DAYS=   5963.3500
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    6, DAYS=   5964.4000
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    7, DAYS=   5965.4500
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    8, DAYS=   5966.5000
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=    9, DAYS=   5967.5500
3)  ===  HISTORY-OUTPUT FILE ===  TAPE13, TAPE REEL NO.=  1, LABEL=B8114       GROUP-RECORD NO.=    1, DAYS=   5968.1500
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=   10, DAYS=   5968.6000
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=   11, DAYS=   5969.6500
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=   12, DAYS=   5970.7000
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=   13, DAYS=   5971.7500
4)  ---  ENERGY-SELECT  FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=B8119       GROUP-RECORD NO.=   14, DAYS=   5972.8000
```

OVER ALL -- ENERGY -- TABLE AS A FUNCTION OF TIME SEQUENCE

DATE OF PROGRAM RUN --- 08/06/76

| SEQUENCE IN DAYS | OVER ALL KINETIC ENERGY VT. MEAN | DEVIATED | TOTAL | OVER ALL POTENTIAL ENERGY | TOTAL ENERGY (KE+PE) |
|---|---|---|---|---|---|
| 5958.250 | 6.843E+22 | 3.799E+23 | 4.481E+23 | 4.2121E+31 | 4.212E+31 |
| 5958.400 | 6.858E+22 | 8.346E+23 | 9.028E+23 | 4.2121E+31 | 4.212E+31 |
| 5958.550 | 6.872E+22 | 1.442E+24 | 1.511E+24 | 4.2121E+31 | 4.212E+31 |
| 5958.700 | 6.882E+22 | 1.681E+24 | 1.749E+24 | 4.2121E+31 | 4.212E+31 |
| 5958.850 | 6.893E+22 | 1.718E+24 | 1.786E+24 | 4.2121E+31 | 4.212E+31 |
| 5959.000 | 6.905E+22 | 1.564E+24 | 1.632E+24 | 4.2121E+31 | 4.212E+31 |
| 5959.150 | 6.925E+22 | 1.373E+24 | 1.442E+24 | 4.2121E+31 | 4.212E+31 |
| 5959.300 | 6.947E+22 | 1.229E+24 | 1.297E+24 | 4.2121E+31 | 4.212E+31 |
| 5959.450 | 6.974E+22 | 1.219E+24 | 1.288E+24 | 4.2121E+31 | 4.212E+31 |
| 5959.600 | 7.002E+22 | 1.179E+24 | 1.248E+24 | 4.2121E+31 | 4.212E+31 |
| 5959.750 | 7.028E+22 | 1.184E+24 | 1.254E+24 | 4.2121E+31 | 4.212E+31 |
| 5959.900 | 7.051E+22 | 1.125E+24 | 1.195E+24 | 4.2121E+31 | 4.212E+31 |
| 5960.050 | 7.073E+22 | 1.075E+24 | 1.145E+24 | 4.2121E+31 | 4.212E+31 |
| 5960.200 | 7.095E+22 | 1.037E+24 | 1.107E+24 | 4.2121E+31 | 4.212E+31 |
| 5960.350 | 7.118E+22 | 1.071E+24 | 1.142E+24 | 4.2121E+31 | 4.212E+31 |
| 5960.500 | 7.139E+22 | 1.110E+24 | 1.181E+24 | 4.2121E+31 | 4.212E+31 |
| 5960.650 | 7.160E+22 | 1.219E+24 | 1.290E+24 | 4.2121E+31 | 4.212E+31 |
| 5960.800 | 7.178E+22 | 1.268E+24 | 1.339E+24 | 4.2121E+31 | 4.212E+31 |
| 5960.950 | 7.196E+22 | 1.336E+24 | 1.408E+24 | 4.2121E+31 | 4.212E+31 |
| 5961.100 | 7.213E+22 | 1.328E+24 | 1.400E+24 | 4.2121E+31 | 4.212E+31 |
| 5961.250 | 7.233E+22 | 1.325E+24 | 1.397E+24 | 4.2121E+31 | 4.212E+31 |
| 5961.400 | 7.253E+22 | 1.271E+24 | 1.343E+24 | 4.2121E+31 | 4.212E+31 |
| 5961.550 | 7.276E+22 | 1.236E+24 | 1.308E+24 | 4.2121E+31 | 4.212E+31 |
| 5961.700 | 7.299E+22 | 1.183E+24 | 1.255E+24 | 4.2121E+31 | 4.212E+31 |
| 5961.850 | 7.321E+22 | 1.168E+24 | 1.241E+24 | 4.2121E+31 | 4.212E+31 |
| 5962.000 | 7.340E+22 | 1.160E+24 | 1.233E+24 | 4.2121E+31 | 4.212E+31 |
| 5962.150 | 7.360E+22 | 1.182E+24 | 1.255E+24 | 4.2121E+31 | 4.212E+31 |
| 5962.300 | 7.376E+22 | 1.222E+24 | 1.296E+24 | 4.2121E+31 | 4.212E+31 |
| 5962.450 | 7.393E+22 | 1.263E+24 | 1.337E+24 | 4.2121E+31 | 4.212E+31 |
| 5962.600 | 7.408E+22 | 1.316E+24 | 1.390E+24 | 4.2121E+31 | 4.212E+31 |
| 5962.750 | 7.423E+22 | 1.349E+24 | 1.422E+24 | 4.2121E+31 | 4.212E+31 |
| 5962.900 | 7.437E+22 | 1.373E+24 | 1.447E+24 | 4.2121E+31 | 4.212E+31 |
| 5963.050 | 7.452E+22 | 1.378E+24 | 1.452E+24 | 4.2121E+31 | 4.212E+31 |
| 5963.200 | 7.466E+22 | 1.369E+24 | 1.443E+24 | 4.2121E+31 | 4.212E+31 |
| 5963.350 | 7.483E+22 | 1.356E+24 | 1.431E+24 | 4.2121E+31 | 4.212E+31 |
| 5963.500 | 7.498E+22 | 1.342E+24 | 1.416E+24 | 4.2121E+31 | 4.212E+31 |
| 5963.650 | 7.515E+22 | 1.340E+24 | 1.415E+24 | 4.2121E+31 | 4.212E+31 |
| 5963.800 | 7.529E+22 | 1.343E+24 | 1.417E+24 | 4.2121E+31 | 4.212E+31 |
| 5963.950 | 7.545E+22 | 1.358E+24 | 1.433E+24 | 4.2121E+31 | 4.212E+31 |
| 5964.100 | 7.558E+22 | 1.376E+24 | 1.451E+24 | 4.2121E+31 | 4.212E+31 |
| 5964.250 | 7.570E+22 | 1.398E+24 | 1.473E+24 | 4.2121E+31 | 4.212E+31 |
| 5964.400 | 7.582E+22 | 1.429E+24 | 1.504E+24 | 4.2121E+31 | 4.212E+31 |
| 5964.550 | 7.593E+22 | 1.453E+24 | 1.529E+24 | 4.2121E+31 | 4.212E+31 |
| 5964.700 | 7.605E+22 | 1.486E+24 | 1.561E+24 | 4.2121E+31 | 4.212E+31 |
| 5964.850 | 7.616E+22 | 1.497E+24 | 1.572E+24 | 4.2121E+31 | 4.212E+31 |
| 5965.000 | 7.627E+22 | 1.506E+24 | 1.581E+24 | 4.2121E+31 | 4.212E+31 |
| 5965.150 | 7.639E+22 | 1.501E+24 | 1.576E+24 | 4.2121E+31 | 4.212E+31 |
| 5965.300 | 7.650E+22 | 1.495E+24 | 1.571E+24 | 4.2121E+31 | 4.212E+31 |
| 5965.450 | 7.661E+22 | 1.502E+24 | 1.578E+24 | 4.2121E+31 | 4.212E+31 |
| 5965.600 | 7.672E+22 | 1.507E+24 | 1.583E+24 | 4.2121E+31 | 4.212E+31 |

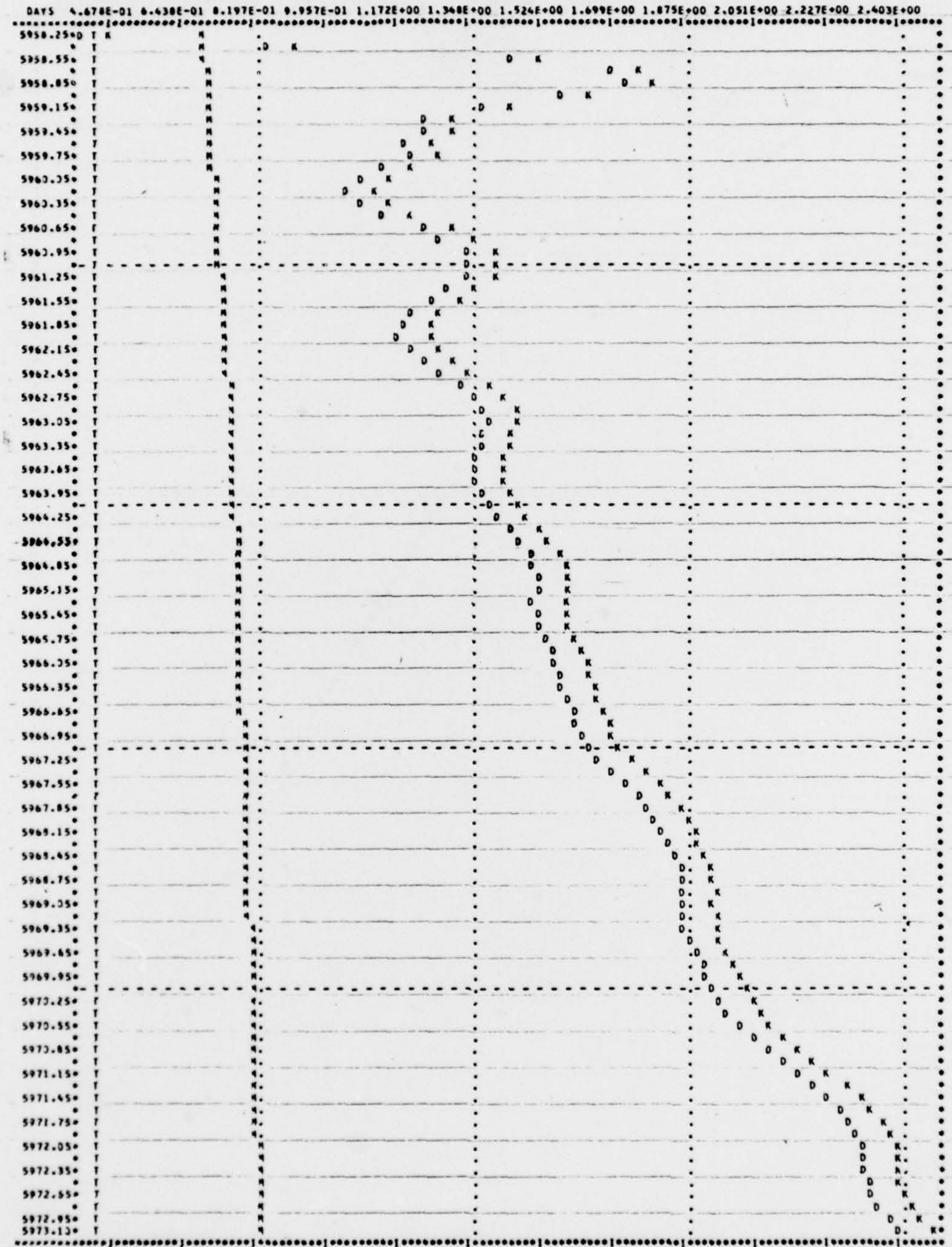
| SEQUENCE IN DAYS | OVER ALL KINETIC ENERGY VT. MEAN | DEVIATED | TOTAL | OVER ALL POTENTIAL ENERGY | TOTAL ENERGY (KE+PE) |
|---|---|---|---|---|---|
| 5965.750 | 7.682E+22 | 1.521E+24 | 1.597E+24 | 4.2121E+31 | 4.212E+31 |
| 5965.900 | 7.693E+22 | 1.536E+24 | 1.612E+24 | 4.2121E+31 | 4.212E+31 |
| 5966.050 | 7.704E+22 | 1.550E+24 | 1.626E+24 | 4.2121E+31 | 4.212E+31 |
| 5966.200 | 7.715E+22 | 1.556E+24 | 1.632E+24 | 4.2121E+31 | 4.212E+31 |
| 5966.350 | 7.725E+22 | 1.566E+24 | 1.643E+24 | 4.2121E+31 | 4.212E+31 |
| 5966.500 | 7.736E+22 | 1.575E+24 | 1.652E+24 | 4.2121E+31 | 4.212E+31 |
| 5966.650 | 7.747E+22 | 1.586E+24 | 1.663E+24 | 4.2121E+31 | 4.212E+31 |
| 5966.800 | 7.757E+22 | 1.598E+24 | 1.675E+24 | 4.2121E+31 | 4.212E+31 |
| 5966.950 | 7.767E+22 | 1.611E+24 | 1.688E+24 | 4.2121E+31 | 4.212E+31 |
| 5967.100 | 7.778E+22 | 1.630E+24 | 1.707E+24 | 4.2121E+31 | 4.212E+31 |
| 5967.250 | 7.788E+22 | 1.655E+24 | 1.732E+24 | 4.2121E+31 | 4.212E+31 |
| 5967.400 | 7.798E+22 | 1.688E+24 | 1.765E+24 | 4.2121E+31 | 4.212E+31 |
| 5967.550 | 7.808E+22 | 1.721E+24 | 1.799E+24 | 4.2121E+31 | 4.212E+31 |
| 5967.700 | 7.819E+22 | 1.754E+24 | 1.831E+24 | 4.2121E+31 | 4.212E+31 |
| 5967.850 | 7.829E+22 | 1.777E+24 | 1.855E+24 | 4.2121E+31 | 4.212E+31 |
| 5968.000 | 7.839E+22 | 1.794E+24 | 1.872E+24 | 4.2121E+31 | 4.212E+31 |
| 5968.150 | 7.849E+22 | 1.809E+24 | 1.887E+24 | 4.2121E+31 | 4.212E+31 |
| 5968.300 | 7.860E+22 | 1.822E+24 | 1.900E+24 | 4.2121E+31 | 4.212E+31 |
| 5968.450 | 7.870E+22 | 1.838E+24 | 1.916E+24 | 4.2121E+31 | 4.212E+31 |
| 5968.600 | 7.881E+22 | 1.849E+24 | 1.928E+24 | 4.2121E+31 | 4.212E+31 |
| 5968.750 | 7.891E+22 | 1.856E+24 | 1.935E+24 | 4.2121E+31 | 4.212E+31 |
| 5968.900 | 7.903E+22 | 1.859E+24 | 1.938E+24 | 4.2121E+31 | 4.212E+31 |
| 5969.050 | 7.913E+22 | 1.857E+24 | 1.936E+24 | 4.2121E+31 | 4.212E+31 |
| 5969.200 | 7.924E+22 | 1.861E+24 | 1.939E+24 | 4.2121E+31 | 4.212E+31 |
| 5969.350 | 7.935E+22 | 1.864E+24 | 1.943E+24 | 4.2121E+31 | 4.212E+31 |
| 5969.500 | 7.946E+22 | 1.875E+24 | 1.954E+24 | 4.2121E+31 | 4.212E+31 |
| 5969.650 | 7.957E+22 | 1.888E+24 | 1.967E+24 | 4.2121E+31 | 4.212E+31 |
| 5969.800 | 7.968E+22 | 1.904E+24 | 1.984E+24 | 4.2121E+31 | 4.212E+31 |
| 5969.950 | 7.979E+22 | 1.916E+24 | 1.996E+24 | 4.2121E+31 | 4.212E+31 |
| 5970.100 | 7.989E+22 | 1.933E+24 | 2.012E+24 | 4.2121E+31 | 4.212E+31 |
| 5970.250 | 8.000E+22 | 1.949E+24 | 2.028E+24 | 4.2121E+31 | 4.212E+31 |
| 5970.400 | 8.010E+22 | 1.971E+24 | 2.051E+24 | 4.2121E+31 | 4.212E+31 |
| 5970.550 | 8.019E+22 | 1.997E+24 | 2.077E+24 | 4.2121E+31 | 4.212E+31 |
| 5970.700 | 8.028E+22 | 2.030E+24 | 2.109E+24 | 4.2121E+31 | 4.212E+31 |
| 5970.850 | 8.037E+22 | 2.062E+24 | 2.142E+24 | 4.2121E+31 | 4.212E+31 |
| 5971.000 | 8.045E+22 | 2.101E+24 | 2.182E+24 | 4.2121E+31 | 4.212E+31 |
| 5971.150 | 8.054E+22 | 2.137E+24 | 2.217E+24 | 4.2121E+31 | 4.212E+31 |
| 5971.300 | 8.063E+22 | 2.177E+24 | 2.257E+24 | 4.2121E+31 | 4.212E+31 |
| 5971.450 | 8.072E+22 | 2.210E+24 | 2.291E+24 | 4.2121E+31 | 4.212E+31 |
| 5971.600 | 8.082E+22 | 2.243E+24 | 2.324E+24 | 4.2121E+31 | 4.212E+31 |
| 5971.750 | 8.093E+22 | 2.268E+24 | 2.348E+24 | 4.2121E+31 | 4.212E+31 |
| 5971.900 | 8.103E+22 | 2.286E+24 | 2.367E+24 | 4.2121E+31 | 4.212E+31 |
| 5972.050 | 8.115E+22 | 2.296E+24 | 2.377E+24 | 4.2121E+31 | 4.212E+31 |
| 5972.200 | 8.126E+22 | 2.301E+24 | 2.382E+24 | 4.2121E+31 | 4.212E+31 |
| 5972.350 | 8.137E+22 | 2.305E+24 | 2.386E+24 | 4.2121E+31 | 4.212E+31 |
| 5972.500 | 8.148E+22 | 2.309E+24 | 2.390E+24 | 4.2121E+31 | 4.212E+31 |
| 5972.650 | 8.159E+22 | 2.320E+24 | 2.401E+24 | 4.2121E+31 | 4.212E+31 |
| 5972.800 | 8.169E+22 | 2.337E+24 | 2.419E+24 | 4.2121E+31 | 4.212E+31 |
| 5972.950 | 8.179E+22 | 2.362E+24 | 2.443E+24 | 4.2121E+31 | 4.212E+31 |
| 5973.100 | 8.188E+22 | 2.392E+24 | 2.474E+24 | 4.2121E+31 | 4.212E+31 |

OVER ALL ENERGY PLOT FROM 5958.250 DAYS TO 5973.100 DAYS

DATE OF PROGRAM RUN --08/06/76

```
(M)   VERTICAL MEAN-HORIZONTAL K.E.-- IN UNIT OF --   1.00000000E+23  ERGS
(D)   DEVIATED-HORIZONTAL K.E.     -- IN UNIT OF --   1.00000000E+24  ERGS
(P)   POTENTIAL-ENERGY             -- IN UNIT OF --   1.00000000E+32  ERGS
(K)   TOTAL KINETIC ENERGY         -- IN UNIT OF --   1.00000000E+24  ERGS
(T)   TOTAL ENERGY (K.E.+P.E.)     -- IN UNIT OF --   1.00000000E+32  ERGS
```

MINIMUM SCALE = 3.79863835E-01    MAXIMUM SCALE = 2.47363318E+00



```
(M)   VERTICAL MEAN-HORIZONTAL K.E.-- IN UNIT OF --   1.00000000E+23  ERGS
(D)   DEVIATED-HORIZONTAL K.E.     -- IN UNIT OF --   1.00000000E+24  ERGS
(P)   POTENTIAL-ENERGY             -- IN UNIT OF --   1.00000000E+32  ERGS
(K)   TOTAL KINETIC ENERGY         -- IN UNIT OF --   1.00000000E+24  ERGS
(T)   TOTAL ENERGY (K.E.+P.E.)     -- IN UNIT OF --   1.00000000E+32  ERGS
```

MINIMUM SCALE = 3.79863835E-01    MAXIMUM SCALE = 2.47363318E+00

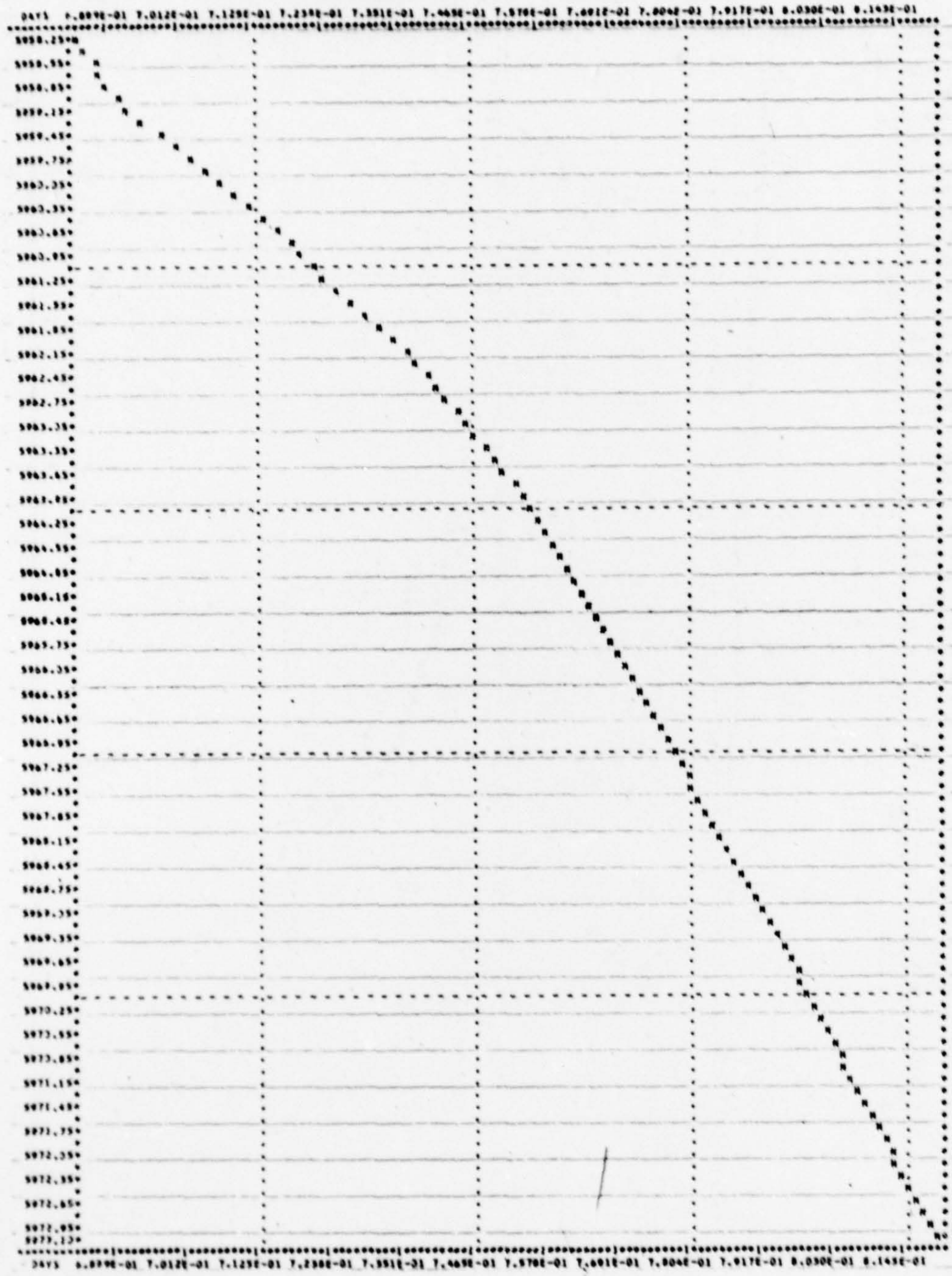
********PROGRAM RUN AT 08/06/76 ********

OVER ALL ENERGY PLOT FROM 5958.250 DAYS TO 5973.100 DAYS

DATE OF PROGRAM RUN --08/06/76

(N) VERTICAL MEAN-HORIZONTAL K.E.-- IN UNIT OF -- 1.00000000E+23 ERGS

MINIMUM SCALE = 6.84263102E-01 MAXIMUM SCALE = 8.18814700E-01



(N) VERTICAL MEAN-HORIZONTAL K.E.-- IN UNIT OF -- 1.00000000E+23 ERGS

MINIMUM SCALE = 6.84263102E-01 MAXIMUM SCALE = 8.18814700E-01

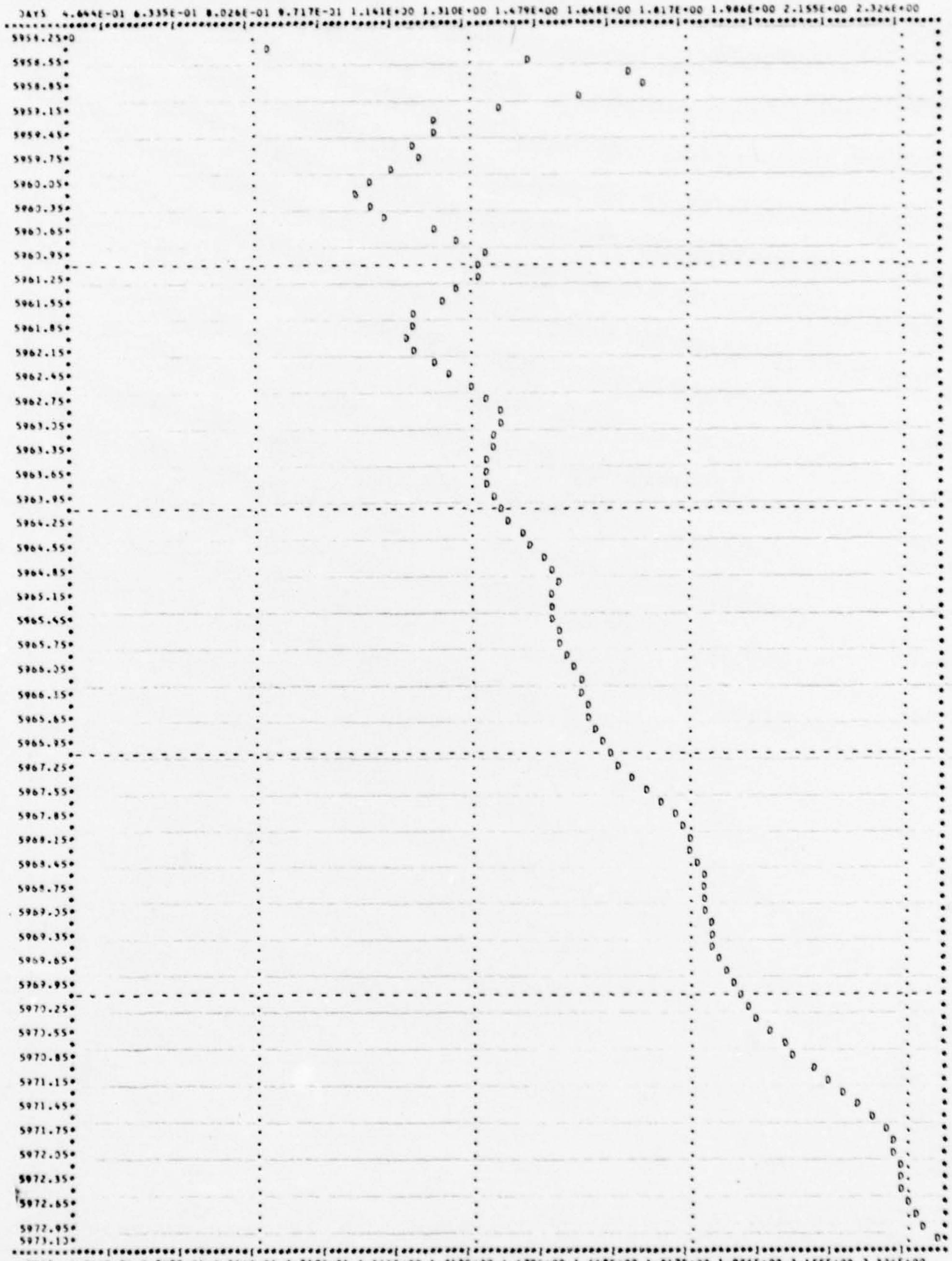
--------PROGRAM RUN AT 08/06/76 --------

OVER ALL ENERGY PLOT FROM 5958.250 DAYS TO 5973.100 DAYS

DATE OF PROGRAM RUN --08/06/76

(D) DEVIATED-HORIZONTAL K.E. -- IN UNIT OF -- 1.00000000E+24 ERGS

MINIMUM SCALE = 3.79863835E-01 MAXIMUM SCALE = 2.39212177E+00




(D) DEVIATED-HORIZONTAL K.E. -- IN UNIT OF -- 1.00000000E+24 ERGS

MINIMUM SCALE = 3.79863835E-01 MAXIMUM SCALE = 2.39212177E+00

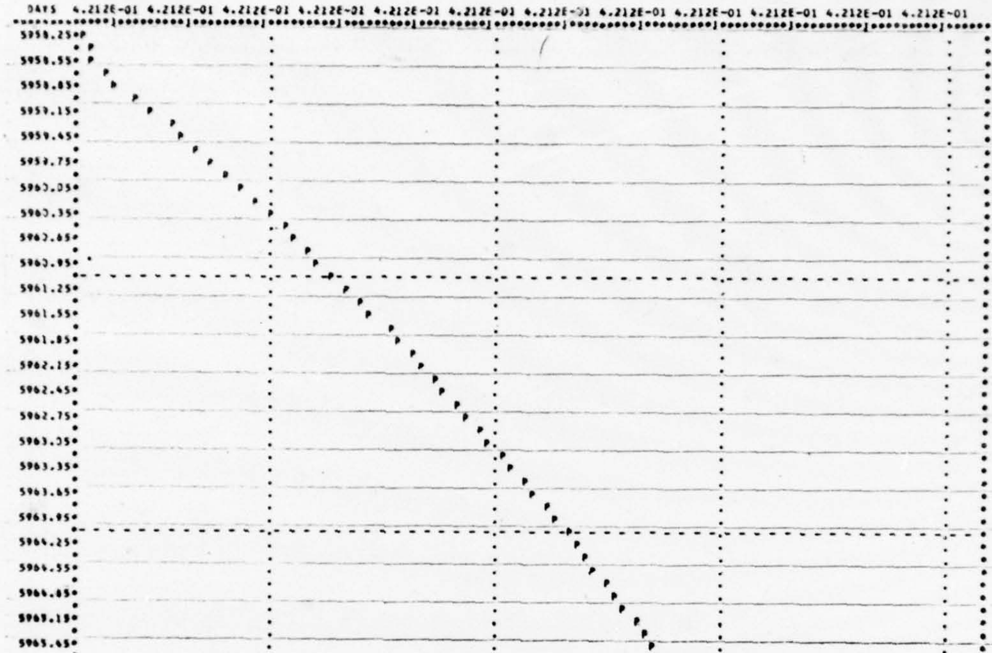
********PROGRAM RUN AT 08/06/76 ********

OVER ALL ENERGY PLOT FROM 5958.250 DAYS TO 5973.100 DAYS

DATE OF PROGRAM RUN --08/06/76

(P) POTENTIAL-ENERGY -- IN UNIT OF -- 1.00000000E+32 ERGS

MINIMUM SCALE = 4.21212124E-01 MAXIMUM SCALE = 4.21212997E-01




(P) POTENTIAL-ENERGY -- IN UNIT OF -- 1.00000000E+32 ERGS

MINIMUM SCALE = 4.21212124E-01 MAXIMUM SCALE = 4.21212997E-01

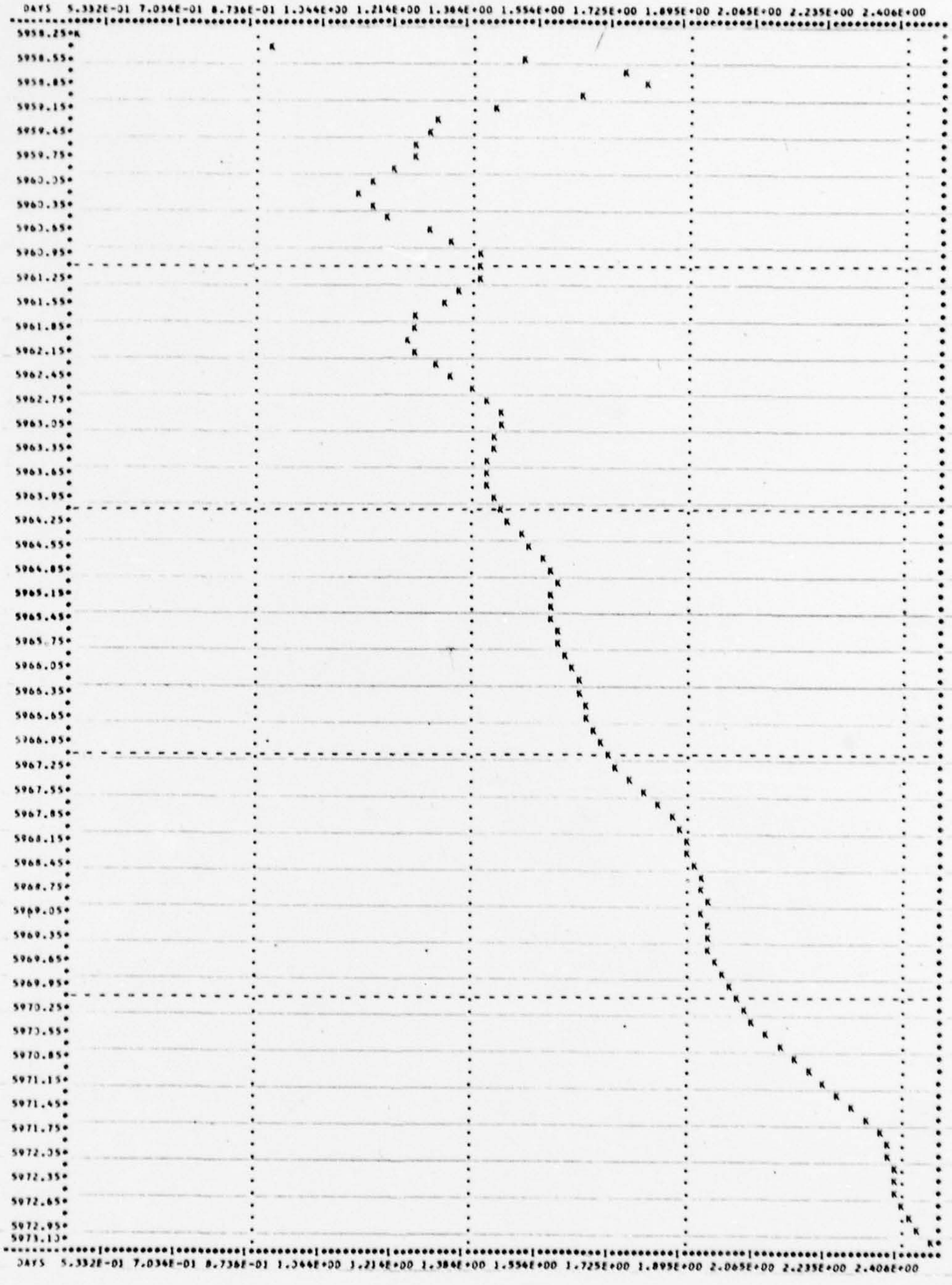
********PROGRAM RUN AT 08/06/76 ********

OVER ALL ENERGY PLOT FROM 5958.250 DAYS TO 5973.100 DAYS

DATE OF PROGRAM RUN --08/06/76

(K) TOTAL KINETIC ENERGY -- IN UNIT OF -- 1.00000000E+24 ERGS

MINIMUM SCALE = 4.48088731E-01 MAXIMUM SCALE = 2.47363318E+00




(K) TOTAL KINETIC ENERGY -- IN UNIT OF -- 1.00000000E+24 ERGS

MINIMUM SCALE = 4.48088731E-01 MAXIMUM SCALE = 2.47363318E+00

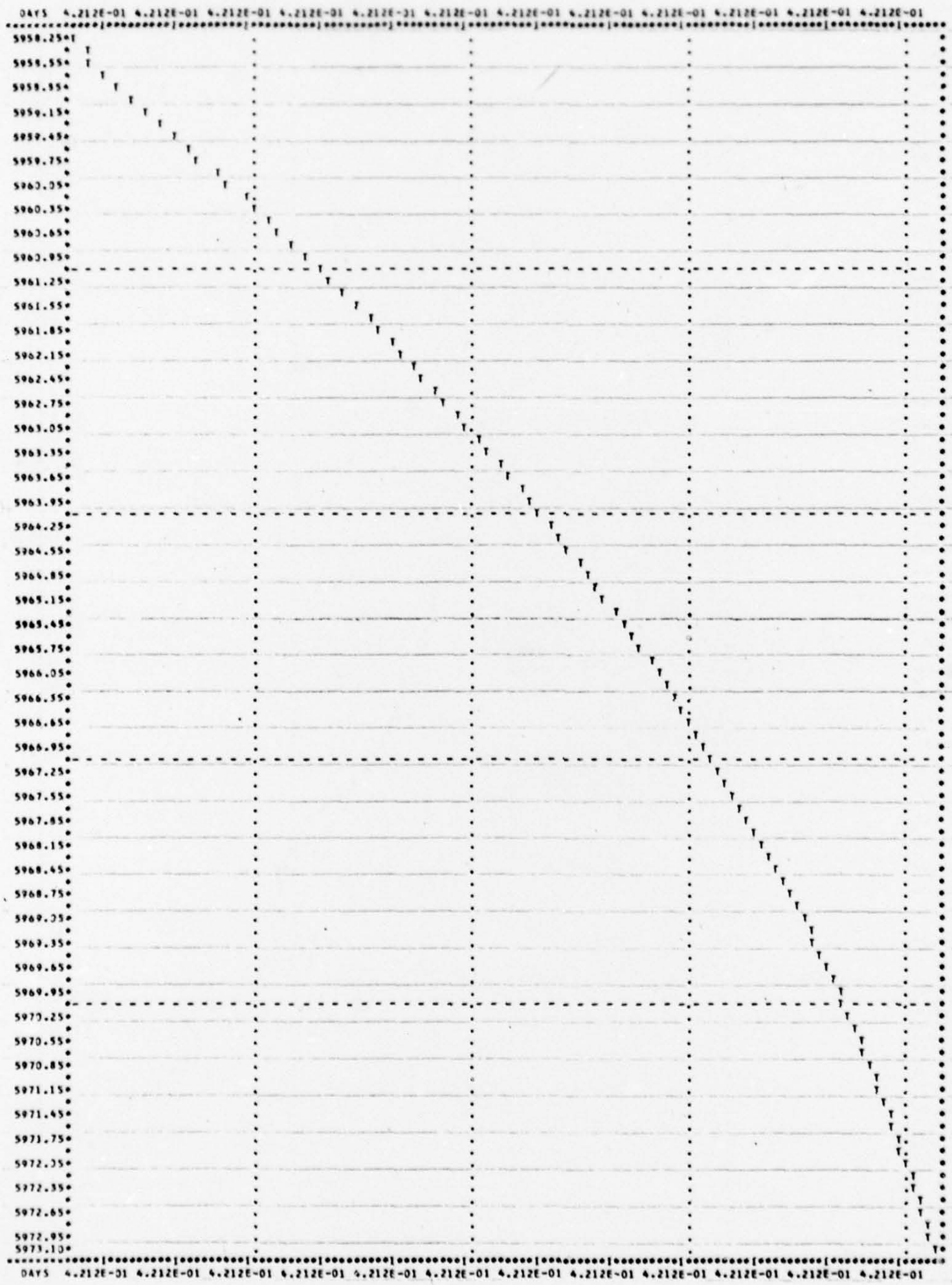
--------PROGRAM RUN AT 08/06/76 --------

OVER ALL ENERGY PLOT FROM 5958.250 DAYS TO 5973.100 DAYS

DATE OF PROGRAM RUN --08/06/76

(T) TOTAL ENERGY (K.E.+P.E.) -- IN UNIT OF -- 1.00000000E+32 ERGS

MINIMUM SCALE = 4.21212128E-01 MAXIMUM SCALE = 4.21213022E-01




(T) TOTAL ENERGY (K.E.+P.E.) -- IN UNIT OF -- 1.00000000E+32 ERGS

MINIMUM SCALE = 4.21212128E-01 MAXIMUM SCALE = 4.21213022E-01

********PROGRAM RUN AT 08/06/76 ********

```
4)  ---  ENERGY-SELECT   FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=88119   GROUP-RECORD NO.=  15, DAYS=  5973.8500
4)  ---  ENERGY-SELECT   FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=88119   GROUP-RECORD NO.=  16, DAYS=  5974.9000
4)  ---  ENERGY-SELECT   FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=88119   GROUP-RECORD NO.=  17, DAYS=  5975.9500
4)  ---  ENERGY-SELECT   FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=88119   GROUP-RECORD NO.=  18, DAYS=  5977.0000
2)  ***HISTORY-STARTING FILE ***  TAPE12, TAPE REEL NO.=  1, LABEL=88109   GROUP-RECORD NO.=   3, DAYS=  5977.9000
2)  ***HISTORY-STARTING FILE ***  TAPE12, TAPE REEL NO.=  1, LABEL=88109   GROUP-RECORD NO.=   4, DAYS=  5978.0500
4)  ---  ENERGY-SELECT   FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=88119   GROUP-RECORD NO.=  19, DAYS=  5978.0500
3)  *** HISTORY-OUTPUT   FILE ***  TAPE13, TAPE REEL NO.=  1, LABEL=88114   GROUP-RECORD NO.=   2, DAYS=  5978.2000
4)  ---  ENERGY-SELECT   FILE ---  TAPE14, TAPE REEL NO.=  1, LABEL=88119   GROUP-RECORD NO.=  20, DAYS=  5979.1000
```

```
                    OVER ALL ENERGY PLOT FROM  6018.250 DAYS TO  6018.400 DAYS
                    **********************************************************          DATE OF PROGRAM RUN --08/06/76

                  (K)    TOTAL KINETIC ENERGY          -- IN UNIT OF --    1.00000000E+24  ERGS

                     MINIMUM SCALE =  3.94539415E+00    MAXIMUM SCALE =  3.94996118E+00

 DAYS  3.946E+00 3.946E+00 3.946E+00 3.947E+00 3.947E+00 3.948E+00 3.948E+00 3.948E+00 3.949E+00 3.949E+00 3.949E+00 3.950E+00
************I*********I*********I*********I*********I*********I*********I*********I*********I*********I*********I*********I******
 6018.25*                          .                             .                             .                             .  K*
 6018.40*K                         .                             .                             .                             .   *
************I*********I*********I*********I*********I*********I*********I*********I*********I*********I*********I*********I******
 DAYS  3.946E+00 3.946E+00 3.946E+00 3.947E+00 3.947E+00 3.948E+00 3.948E+00 3.948E+00 3.949E+00 3.949E+00 3.949E+00 3.950E+00

                  (K)    TOTAL KINETIC ENERGY          -- IN UNIT OF --    1.00000000E+24  ERGS

                     MINIMUM SCALE =  3.94539415E+00    MAXIMUM SCALE =  3.94996118E+00

                              ********PROGRAM RUN AT 08/06/76  ********
```

```
                         OVER ALL ENERGY PLOT FROM  6018.250 DAYS TO  6018.400 DAYS
                         ***********************************************************          DATE OF PROGRAM RUN --08/06/76

                    (T)   TOTAL ENERGY (K.E.+P.E.)      -- IN UNIT OF --   1.00000000E+32  ERGS

                         MINIMUM SCALE =  4.21211391E-01    MAXIMUM SCALE =  4.21211403E-01

  DAYS  4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01
*************I*********I*********I*********I*********I*********I*********I*********I*********I*********I*********I*********I******
 6018.25*                  .                              .                              .                              .   T*
 6018.40*T                 .                              .                              .                              .    *
*************I*********I*********I*********I*********I*********I*********I*********I*********I*********I*********I*********I******
  DAYS  4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01 4.212E-01

                    (T)   TOTAL ENERGY (K.E.+P.E.)      -- IN UNIT OF --   1.00000000E+32  ERGS

                         MINIMUM SCALE =  4.21211391E-01    MAXIMUM SCALE =  4.21211403E-01

                                     ********PROGRAM RUN AT 08/06/76  ********


      *****PARTIAL FILLED TAPE OF  ***HISTORY-STARTING FILE ***    TAPE LOGICAL NO.=12
 REEL NO.=   1 (LABEL=88109   =88109   )  NO. OF MAXIMUM GROUP-RECORDS PER TAPE=    20,  NO. OF GROUP-RECORDS WRITTEN=    10

      ********** TAPE12 IS NO LONGER NEEDED FOR THIS RUN.

      *****PARTIAL FILLED TAPE OF  *** HISTORY-OUTPUT  FILE ***    TAPE LOGICAL NO.=13
 REEL NO.=   1 (LABEL=88114   =88114   )  NO. OF MAXIMUM GROUP-RECORDS PER TAPE=    20,  NO. OF GROUP-RECORDS WRITTEN=     6

      ********** TAPE13 IS NO LONGER NEEDED FOR THIS RUN.

      *****PARTIAL FILLED TAPE OF  ---  ENERGY-SELECT  FILE ---    TAPE LOGICAL NO.=14
 REEL NO.=   1 (LABEL=88119   =88119   )  NO. OF MAXIMUM GROUP-RECORDS PER TAPE=  3000,  NO. OF GROUP-RECORDS WRITTEN=    57

      ********** TAPE14 IS NO LONGER NEEDED FOR THIS RUN.


                         **********NORMAL END OF JOB**********


  TOTAL CPU TIME IN MILLISECONDS =  1753387
        PPU TIME IN MILLISECONDS =    56442
                   PAGES PRINTED =       87
                     DD80 FRAMES =     1303
           TOTAL RESOURCES USED =  1432.14

                                            DISK BLOCK USAGE SUMMARY
                                  ODD UNITS                         EVEN UNITS
                                    DISK 0                            DISK 1
    LIMIT ON BLOCKS ALLOWED           4095                              4095
    MAXIMUM BLOCKS USED                 60                                36
    PLIB BLOCKS FOR THIS PROJECT         3

                                            TAPE ACTIVITY SUMMARY
```

## DISK BLOCK USAGE SUMMARY

| | ODD UNITS DISK 0 | EVEN UNITS DISK 1 |
|---|---|---|
| LIMIT ON BLOCKS ALLOWED | 4095 | 4095 |
| MAXIMUM BLOCKS USED | 60 | 36 |
| PLIB BLOCKS FOR THIS PROJECT | 3 | |

## TAPE ACTIVITY SUMMARY

| TAPE LABEL | PHYSICAL UNIT | CHANNEL PARITY ERRORS ON CHAN 10, | CHAN 11, | READ ERRORS | WRITE ERRORS | RECORDS READ | WORDS READ | FILE MARKS READ | RECORDS WRITTEN | WORDS WRITTEN | FILE MARKS WRITTEN |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R0 D | 0 | 0 | 0 | 0 | 0 | 1 | 73 | 0 | 0 | 0 | 0 |
| SLIB D | 1 | 0 | 0 | 0 | 0 | 20 | 68710 | 0 | 0 | 0 | 0 |
| 11 D | 0 | 0 | 0 | 0 | 0 | 22 | 61952 | 0 | 19 | 49664 | 0 |
| CNSTF B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 D | 1 | 0 | 0 | 0 | 0 | 288 | 1158528 | 0 | 246 | 969344 | 0 |
| STRTF B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 D | 0 | 0 | 0 | 0 | 0 | 148 | 585088 | 0 | 152 | 584320 | 0 |
| HOUTF B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 D | 1 | 0 | 0 | 0 | 0 | 121 | 474496 | 0 | 125 | 473728 | 0 |
| EGSLF B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PLIB D | 1 | 0 | 0 | 0 | 0 | 23 | 45292 | 0 | 0 | 0 | 0 |
| SSCR B | 0 | 0 | 0 | 0 | 0 | 161 | 41216 | 0 | 161 | 41216 | 0 |
| SSCR D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LG0 B | 0 | 0 | 0 | 0 | 0 | 138 | 51744 | 2 | 69 | 25872 | 0 |
| LG0 D | 1 | 0 | 0 | 0 | 0 | 6 | 61440 | 0 | 3 | 30720 | 0 |
| RANF0 D | 0 | 0 | 0 | 0 | 0 | 9 | 1537987 | 0 | 9 | 1537987 | 0 |
| 88019 B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 44287 | 0 |
| PR D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 20480 | 0 |
| 0080 D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 518 | 1060864 | 0 |
| 88109 B | 0 | 0 | 0 | 0 | 0 | 66 | 190104 | 0 | 330 | 950520 | 2 |
| 88109 | 3 | 0 | 0 | 0 | 0 | 66 | 190104 | 1 | 330 | 950520 | 2 |
| 88114 B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 198 | 570312 | 0 |
| 88119 B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 228 | 460560 | 0 |
| 88019 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 70 | 44287 | 2 |
| 88114 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 198 | 570312 | 2 |
| 88119 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 228 | 460560 | 2 |

SYSTEM TAPE D70 GENERATED 08/02/76 AT 09/06 FROM SOURCE TAPE E8

~~LIST OF ROUTINES MODIFIED~~
CTC DTL TIC